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Bureau of Land Management

Cave Valley Watershed Evaluation Report

Ely Field Office
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Cave Valley Watershed Evaluation Report

Introduction

General Background

Cave Valley is one of sixty-one total watershed management units on the Ely District. This watershed is located south of Ely, Nevada, and is flanked by the South Schell Creek Mountains on the East and the South Egan Mountains on the West. It is characterized by generally north to south trending mountains, gently to steeply sloping benches and bajadas, and one valley bottom characterized by level to slightly rolling terrain. The watershed drains internally into alkali sinks towards the south-central portion of the valley. Elevations in the watershed vary from about 5, 900 feet in the valley bottom to 10, 990 feet on top of the South Schell Creek Mountain Range. Precipitation varies from a yearly average of about 8 to 10 inches on the valley bottom to 20 inches or more on top of the South Egan and South Schell Creek Mountains. Precipitation occurs as winter snow or spring/fall thundershowers and rains with the driest period occurring from midsummer to midautumn. Average annual air temperature is from 40 to 50 degrees Fahrenheit, decreasing as elevation increases. The average frost-free season is from 100 to 120 days in the valley bottom to 50 to 70 days in upper elevations.

The watershed constitutes approximately 229,480 acres. Included in this total are 224,082 acres (97 %) of Bureau of Land Management (BLM) administered public land and 5,398 (3 %) acres of private land. Allotments included within this watershed are large portions of the Cave Valley Ranch (#904), Haggerty Wash (#907), Cave Valley Seeding (#00908), Sunnyside (#21023), and the Shingle Pass (#00906) Allotments and small portions of the Cattle Camp/Cave Valley (#00903), Sheep Pass (#00905), and Chimney Rock (#00914) Allotments (Map 1).

Vegetation communities within the watershed include sagebrush communities including black sagebrush, low sagebrush, basin big sagebrush, Wyoming big sagebrush, and mountain big sagebrush communities. Additional rangeland communities within the include winterfat, greasewood, mountain brush and mahogany communities. Woodland communities within the watershed include pinyon and/or juniper communities, and mixed conifer and aspen at higher elevations. Riparian areas are also located within the watershed.

BLM has worked in this watershed for several years to develop agreements with livestock permittees. Cattle are the sole livestock grazers on this watershed. The Sunnyside allotment is managed according to the Management Framework Plan and the Record of Decision for the Schell Grazing Environmental Impact Statement that was issued in June and July of 1983, respectively. Effective April 1, 1996, grazing on the

Sunnyside allotment will be in accordance with the deferred rotational grazing system with a season of use from 6/01-3/31 as outlined below:

YEAR	NORTH	SOUTH	CAVE VALLEY	REST
1	12/10-3/31	8/21-12/09	6/01-8/20	4/01-5/31
2	12/10-3/31	6/01-9/18	9/19-12/09	4/01-5/31
3	8/21-12/09	12/10-3/31	6/01-8/20	4/01-5/31
4	6/01-9/18	12/10-3/31	9/19-12/09	4/01-5/31
5	Same as year one			

An analysis of the monitoring data of the Cave Valley Ranch allotment indicated that cattle grazing caused over-utilization in a small portion of the native range. Based on range studies and ocular estimates, forage is available in the southern portion of the allotment with excellent grass coverage. Following these findings some range improvements have been made such as altering the AUMs that can graze in the seedings and elsewhere, and determining the season of use to be from May 1st to October 31st. Part of the stipulation required that Harris Well be pumped to the southern portion of the allotment to allow cattle to take advantage of the under-utilized areas and distribute the use more evenly throughout the allotment. Use pattern mapping was conducted in 1988 and 1991 on the native range and seeding areas. The majority of use for both years in the native range was slight with ten percent categorized as heavy to severe use. In 1988, all of the use was categorized in the moderate range for the seedings; in1991 use was mostly categorized as light.

The preference for the Shingle Pass allotment is 2,802 AUMs for cattle use with a current permitted season of use from May 19 to October 15. The three-year average listed in the Egan Resource Management Plan and Rangeland Program Summary is 1,867 AUMs per year of cattle use (calculated for 1979-1981). Utilization patterns were mapped in the native pasture, and it was determined that seventy percent of this native pasture is not useable by livestock due to slope, rock, and dense woodlands. Even though a large portion of the allotment is within the slight use class, a small amount of heavy to severe use has occurred which has exceeded the allowable use levels. The heavy to severe use occurs south of Sawmill Well, in the Big Seeding, and the upper portion of Long Canyon.

The Cattle Camp/Cave Valley allotment has historically been used by livestock for a long time. Domestic livestock came into the area with the advent of mining activities after the Civil War. Livestock husbandry typically followed mining development. During the first quarter of the twentieth century several cattle outfits were in operation in the northern part of the valley. In addition, cattle were brought in from ranches near Sunnyside. Considerable horse use also occurred in the valley. Sheep were trailed through the valley to winter ranges in the south and then trailed north again in the spring. During more favorable years, sheep were grazed in the south end of Cave Valley during the winter. After the Ely Grazing District was established in 1936, range surveys were conducted and grazing use was adjudicated. Besides domestic sheep and cattle grazing, the Cattle Camp Area has been historically used by elk, mule deer, and mountain bighorn sheep from nearby Mount Grafton.

At present, cattle are trailed in the Cattle Camp/Cave Valley allotment in varying numbers from 5/15 to 6/30 through Sawmill Canyon or Sheep Pass from winter range in Preston-Lund. Dry cows and fall calving cows are kept separate from cattle with spring calves. These cattle numbers vary from year to year and are dependent on the number of open cows wintered. Numbers are normally maintained throughout the months of July, August, and September. In October, cattle numbers are reduced between pasture moves. In November, cattle are started on the trail toward Preston-Lund. Cattle will continue to be trailed or trucked out of the allotment until mid December. A rest rotation grazing system has been practiced in the allotment since 1974. A consistent rotational scheme as outlined in the original AMP was not followed, however. At times, two pastures were rested in the same year, which also put heavy grazing pressure on the other pastures. A listing of the grazing treatments used in the Cattle Camp/Cave Valley allotment from 1980-1985 was taken from actual use records and is contained in the AMP support file.

The watershed analysis guidelines and processes described in BLM Handbook, *H-4180-1 Rangeland Health Standards* are being used to analyze watersheds in the Ely district. This watershed approach allows the BLM to focus on flexible management techniques necessary to accommodate the functionality of the watershed. It allows for a shift from species and individual use-driven management to the natural systems that support s in properly functioning conditions.

Process

This evaluation was done in accordance with BLM regulations regarding Rangeland Health Standards:

- Title 43 Code of Federal Regulation (43 CFR), subpart 4180
- Bureau of Land Management (BLM) Handbook *H-4180-1 Rangeland Health Standards*
- Standards and Guidelines for Nevada's Mohave-Southern Great Basin Area.

Standards are statements of physical and biological condition or degree of function required for healthy sustainable rangelands. Achieving or making significant progress towards these functions and conditions is required of all uses of public rangelands as stated in 43 CFR 4180.1. Standards were developed for the geographic area covered by the Mohave-Southern Great Basin Area Resource Advisory Council (RAC).

This report will evaluate the status of resource condition against the Mohave-Southern Great Basin Area RAC Standards for Rangeland Health using methods outlined in *H-4180-1 Rangeland Health Standards*. The standards and guidelines for the Mohave-Southern Great Basin Area are abbreviated below:

Standard #1 Soils
Standard #2 Ecosystem Components
Standard #3 Habitat and Biota
Standard #4 Wild Horses and Burro Populations

Staff resource specialists from the Ely Field Office were included on the interdisciplinary (ID) team for public lands in Cave Valley Watershed. Available monitoring data, standardized methodologies and field assessments were used by the watershed evaluation ID team to characterize the status of resource conditions. The ID team used ecological site descriptions as developed by the Natural Resources Conservation Service (NRCS) to compare existing vegetative health and cover composition to vegetation potential. Appropriate ecological site descriptions were determined using current soil survey information. Summaries of assessment data are included in this evaluation report for clarity and all assessment data is available for review at the Ely Field Office.

Line-point intercept data was collected for the basin big sagebrush, mountain big sagebrush, Wyoming big sagebrush, black sagebrush, low sagebrush, greasewood, and winterfat, and mountain mahogany rangeland communities, and juniper and pinyon-juniper woodland communities. Line point intercept cover data was gathered on the watershed in 2007.

Allotment specific data such as utilization, ecological condition, line intercept cover, use pattern mapping and trend was also collected at key areas and examined as part of the allotment evaluations for livestock. These data have been analyzed and evaluated as a part of these evaluations and are summarized in this document in Appendix A.

Sequence of Events

The 4180-1 handbook defines four phases of watershed analysis: 1) assessment of the watershed data to estimate current conditions, 2) evaluation of the assessment data, 3) determination of standards, and 4) developing a landscape management strategy. This evaluation report is a land health evaluation based on watershed level assessment data used to estimate the current condition of 224,082 acres of public lands administered by the BLM. The report documents the evaluation process. The subsequent landscape implementation strategy would be a separate document for guiding activities in the watershed. This strategy would stem from the recommendations given in this evaluation.

In this evaluation report we compare existing conditions to RACs' rangeland health standards, by evaluating the degree of achievement of rangeland health standards. If a standard is not met, making significant progress toward achievement, or there is lack of conformance with guidelines, an analysis and interpretation of the causal factors is conducted and causal factors are identified. The determination document records the authorized officers' finding that existing grazing management practices or levels of grazing use on public lands either are or are not significant factors in failing to achieve the standards.

In addition to evaluating biological data and comparing the existing conditions to the RACs' standards, other uses such as recreation activities (indicated by roads and trails), rights-of-way grants, and mineral disturbances will be evaluated. These uses can also

affect the health of a watershed and can create disturbance or are in combination with other factors a causal factor for not achieving a standard or standards.

This report also contains recommendations developed by the watershed evaluation ID team during field evaluation and analysis of existing data. Recommendations in this report focus on land use activities needed to have proper functioning conditions in the watershed. All land uses and programs are assessed and documented as part of this process. The authorized officer considers the evaluation to determine if rangeland health standards are being met, and then signs a *Determination of Standards* documenting the degree of meeting or not meeting a standard and the causal factors for not meeting.

The evaluation and recommendations in this report help to choose the most effective management to initiate progress towards meeting standards.

43 CFR 4180.2(c) states in part, "the authorized officer shall take appropriate action as soon as practicable but not later than 24 months from the date of the determination that existing grazing management practices or levels of grazing use on public lands are significant factors in failing to achieve the standards and conform with the guidelines…". The 4180-1 handbook says, "Where existing grazing management or levels of grazing use are not significant factors, then watershed restoration plans will be developed to address management actions needed to achieve the standards. Landscape management strategies for the watershed will be developed in consultation and coordination with affected permittees, the state having lands or managing resources within the area and other interested parties. As with all similar BLM decisions, affected parties will have an opportunity to protest and/or appeal decisions to implement all or portions of the strategy." Appropriate site-specific National Environmental Policy Act (NEPA) analysis would be completed prior to implementing management decisions.

Summary of Findings by Standards

"STANDARD 1. SOILS: Watershed soils and stream banks should have adequate stability to resist accelerated erosion, maintain soil productivity, and sustain the hydrologic cycle.

Soil indicators:

- Ground cover (vegetation, litter, rock, bare ground);
- Surfaces (e. g. biological crusts, pavements); and
- Compaction/infiltration.

Riparian soil indicators:

- Stream bank stability."

The analysis and interpretation of the findings by the Cave Valley watershed evaluation ID Team indicates this standard is not being achieved. Line point-intercept cover data and road inventory data were analyzed and interpreted. Soil map units with similar characteristics and dominant vegetation were lumped together and categorized according to potential vegetation communities for this evaluation. The standards utilized in this evaluation are derived from the percent-by-weight composition values described in the ecological site descriptions for the soil map units. An in-depth description of the potential vegetation communities for the Cave Valley Watershed may be found in the following standard summary entitled "Standard 2. Ecosystem Components."

Potential woodland communities in the Cave Valley Watershed comprise approximately 27 percent of the watershed (Map 2, Figure 2.1 in Standard 2). Current estimates of tree canopy cover for pinyon-juniper woodlands and curl-leaf mountain mahogany communities in the Cave Valley Watershed and their standards are summarized in Table 1.1. Current estimates of the understory ground cover composition for pinyon-juniper woodlands and curl-leaf mountain mahogany communities and their standards are summarized in Table 1.2. As overstory tree canopy cover exceeds the mature woodland canopy cover limits described in the ecological site descriptions, understory vegetation in the interspaces will become sparse or absent. A reduction in interspace understory increases the potential for rapid runoff and sheet and rill erosion. However, if a significant amount of understory is still present and the understory composition is within the ranges described in the standards, then the potential increases for the understory to recover following an event that reduces canopy cover.

The average overstory canopy cover for pinyon-juniper woodlands meets the soils standard as with an average canopy cover of 33 percent. This conclusion may be misleading since juniper savannahs, for which the rangeland ecological site descriptions indicate an average overstory canopy of less than 10 percent, were included in the pinyon-juniper analysis. When juniper savannahs and pinyon-juniper woodlands are considered separately, the average overstory canopy cover observed in juniper savannahs is 15.5 percent and in pinyon-juniper woodlands is 40 percent. Neither pinyon-juniper woodlands nor juniper savannahs meet the soils standard when considered separately.

However, the soil map units for which juniper savannah community types dominate were included as part of the pinyon-juniper woodlands communities in the estimation of potential vegetation communities. Since this evaluation requires an average estimate of cover for such a broad grouping, one may conclude that some pinyon-juniper woodland communities may be meeting the soils standard while other communities are not meeting the standard.

The estimated proportion of the total cover as understory for pinyon-juniper woodlands is 45.3 percent, which incorporates juniper savannah communities' understory estimated at 70.5 percent and the pinyon-juniper woodland communities' understory estimated at 38.4 percent. The understory functional group composition for pinyon-juniper woodlands, both including and excluding juniper savannahs, does not meet the described soils standards as a whole (Table 1.2). This is partly due to the prevalence of cheatgrass within these communities which comprises 16 to 20 percent of the total understory ground cover.

One site was evaluated in a seeding in pinyon-juniper woodland. The pinyon-juniper woodland seeding did not meet the soils standard with an average canopy of 9 percent, far below the described standard. The estimated proportion of total cover as understory for the pinyon-juniper seeding is 83.5 percent with the shrub and grass ground cover components meeting the understory soils standard. The forb component for the pinyon-juniper seeding was far below the described standard.

The overstory canopy cover for curl-leaf mountain mahogany communities meets the soils standards with an average canopy cover of 31 percent. The estimated proportion of the total cover as understory is 64.3 percent. The understory functional group composition for curl-leaf mountain mahogany communities does not meet the described standards as a whole with shrub cover composition higher than the standard and herbaceous cover composition much lower than the standard. This may, in part, be due to the prevalence of cheatgrass within these communities which comprise 18.5 percent of the total understory ground cover.

Table 1.1. Comparison of the Average Percent Tree Canopy Cover and the Ecological Site Descriptions' Standard for Woodland Communities in the Cave Valley Watershed.

Woodland Community Type	**Total Sites**	**Estimated Percent Tree Canopy Cover**	***Ecological Site Description Standard Tree Canopy Cover***
Pinyon-Juniper Woodlands (including Savannahs)	30	33	***20-35***
Juniper Savannah	8	15.5	***<10***
Pinyon-Juniper Woodlands (excluding savannahs)	22	40	***20-35***
Pinyon-Juniper Seeding	1	9	***20-35***
Curl-leaf Mountain Mahogany	5	31	***35-50***

Table 1.2. Comparison of the Average Percent Total Understory Ground Cover and Percent Understory Ground Cover Composition as Reported by Functional Group with the Ecological Site Descriptions' Standards for Woodland Communities in the Cave Valley Watershed.

Woodland Community Type	**Total Sites**	**Estimate Under-story Ground Cover**	**Estimated Understory Ground Cover Composition (Percent Cover)**				***Standard Understory Composition (Percent-by-Weight)***		
		(Percent of Total Cover)	Shrubs	Grasses	Forbs	Cheat-grass	***Shrubs***	***Grasses***	***Forbs***
Pinyon-Juniper Woodlands (including Savannahs)	30	45.3	43	31.5	6	19.5	***30-50***	***35-60***	***10-20***
Juniper Savannah	8	68.7	46	30.2	4.6	19.1	***53-58***	***37-41***	***5-6***
Pinyon-Juniper Woodlands (excluding savannahs)	22	38.4	41	32	7	20	***30-50***	***35-60***	***10-20***
Pinyon-Juniper Seeding	1	83.5	35.1	64.6	0.3	0	***30-50***	***35-60***	***10-20***
Curl-leaf Mountain Mahogany	5	64.3	40.5	33.5	7.5	18.5	***35***	***55***	***10***

In addition to canopy cover and understory ground cover composition, data was collected to estimate the soil surface composition of woodland communities in the Cave Valley Watershed (Table 1.3). No standard exists to which to compare the estimates of current conditions for soil surfaces. Heterogeneous vertical and horizontal vascular plant structure within vegetation communities optimizes growing conditions for biological soil crusts. The homogenization of functional group and species composition will decrease overall biological soil crust cover and species richness. The soil surface composition of all woodland communities in the Cave Valley Watershed is dominated by litter followed by rock and bare soil. Very little or no biological soil crusts are present.

Table 1.3. Current Estimates of Average Soil Surface Composition for Woodland Communities in the Cave Valley Watershed.

Woodland Community Type	Bare Soil*	Biotic Crust	Lichen	Litter	Moss	Plant	Rock
Pinyon-Juniper Woodlands (including Savannahs)	28.1	0.4	0.7	52.3	0.5	1.2	16.8
Juniper Savannah	32.7	1	1.7	42.5	0.8	2.4	18.9
Pinyon-Juniper Woodlands (excluding savannahs)	26.5	0.2	0.3	55.8	0.5	0.7	16.0
Pinyon-Juniper Seeding	21.5	4.5	0	22.5	6	1.5	44
Curl-leaf Mountain Mahogany	13.3	0	0.7	62.8	0.3	1.7	21.2

* 'Bare Soil' refers to the lack of any other soil surface at the point of observation and does not take into consideration whether vegetation occurred directly above (vegetation cover is referred to in this evaluation as 'ground cover').

Potential sagebrush communities comprise approximately 69.5 percent of the Cave Valley Watershed (Map 2, Figure 2.1 in Standard 2). Current estimates of percent ground cover for individual sagebrush communities compared to ecological site description standards are summarized in Table 1.4. The average percent ground cover for all but one of the sagebrush communities exceeds the described standards. Wyoming big sagebrush communities that occur within seedings are the exception in that they do meet the total ground cover standard. Total ground cover that is higher than the described standards may be interpreted as an increase in raindrop interception, decreasing possible erosion. However, if the increase in cover is primarily comprised of overstory canopy cover, the overstory species could out-compete understory herbaceous species, reducing

the herbaceous ground cover in the intercanopy spaces and increasing the erosion potential in these intercanopy areas.

Table 1.4. Comparison of Average Percent Ground Cover with the Ecological Site Descriptions' Standard for Sagebrush Communities inside and outside seedings in the Cave Valley Watershed.

Sagebrush Community Type	**Total Sites**	**Estimated Ground Cover**	***Standard Ground Cover***
Basin Big Sagebrush	2	66.3	***20-50***
Black Sagebrush	22	42.1	***5-30***
Low Sagebrush	2	47.8	***15-20***
Mountain Big Sagebrush	11	59.4	***15-40***
Wyoming Big Sagebrush	27	39.5	***5-35***
Seedings			
Black Sagebrush Seeding	1	56.0	***5-30***
Wyoming Big Sagebrush Seeding	5	34.0	***5-35***

The total ground cover broken down according to functional group composition for the sagebrush communities is summarized in Table 1.5. The standards as described in the ecological site descriptions are summarized in Table 1.6. With the exception of Wyoming big sagebrush communities that occur inside seedings, tree ground cover composition exceeds the standard as described in the ecological site descriptions while grass and forb ground cover composition are far below the standard. The basin big sagebrush, mountain big sagebrush, and Wyoming big sagebrush communities outside of seedings also demonstrate shrub ground cover compositions that were higher than the described standard. An increase in tree canopy cover or shrub ground cover coinciding to a decrease in herbaceous species cover, especially fibrous-rooted perennial grasses, increases the erosion potential.

An increase in cheatgrass ground cover at the expense of fibrous-rooted perennial grasses may also increase erosion potential as cheatgrass does not have an extensive root system and the whole plant, roots included, dies at the end of the growing season. Cheatgrass is present in all sagebrush community types, though its presence tends to be site-specific. Cheatgrass composes a very high percentage of the ground cover at several sites and little or no percentage of the ground cover at the majority of sites.

Table 1.5. Average Percent Ground Cover Composition of Sagebrush communities Inside and Outside Seedings in the Cave Valley Watershed as Reported by Functional Groups and Cheatgrass.

Sagebrush Community	Total Sites	Trees	Shrubs	Grasses	Forbs	Cheat-grass
Type						
Basin Big Sagebrush	2	4.9	60.2	30	0.3	4.6
Black Sagebrush	22	16.1	45.8	23.4	3.3	11.4
Low Sagebrush	2	18.9	35.9	27.6	2.0	15.6
Mountain Big Sagebrush	11	11.8	47.8	24	3.4	13.0
Wyoming Big Sagebrush	27	6.2	73.7	14.3	2.8	8.9
Seedings						
Black Sagebrush Seedings	1	25.8	29.5	29.5	0.1	15.1
Wyoming Big Sagebrush Seedings	5	0	36.4	58.4	3.4	1.8

Table 1.6. Soils Standard: Average Percent-by-Weight Composition described in Ecological Site Descriptions for Sagebrush Communities as Reported by Functional Groups.

Sagebrush Community	Trees	Shrubs	Grasses	Forbs	Cheatgrass
Type					
Basin Big Sagebrush	***0-3***	***10-25***	***65-85***	***5-10***	***0***
Black Sagebrush	***0-5***	***45****	***50****	***5***	***0***
Low Sagebrush	***0-2***	***40-45***	***45-50***	***10***	***0***
Mountain Big Sagebrush	***0-3***	***30****	***60****	***5-10***	***0***
Wyoming Big Sagebrush	***0-3***	***50****	***45****	***5***	***0***

* Starred functional group standards are averages of the reported values in the ecological site descriptions for the sagebrush communities being described.

In addition to canopy cover and understory ground cover composition, data was collected to estimate the soil surface composition of sagebrush communities in the Cave Valley Watershed (Table 1.7). No standard exists for comparing the estimates of current conditions for soil surfaces. The soil surface of all sagebrush communities in the Cave Valley Watershed is dominated by bare soil and litter with very little or no biological soil crusts present.

Table 1.7. Current Estimates of Average Soil Surface Composition for Sagebrush Communities in the Cave Valley Watershed.

Sagebrush Community Type	Bare Soil*	Biotic Crust	Lichen	Litter	Moss	Plant	Rock
Basin Big Sagebrush	29.75	0	0	67.75	.5	2	0
Black Sagebrush**	41.3	0.2	0.4	33.9	0.4	1.9	19.3
Seeding	47.5	0	0	48	0	4	0.5
Low Sagebrush	44	0	0	42.5	0	1.25	12.25
Mountain Big Sagebrush	23.2	0.05	0.1	65.3	0.1	1.5	9.8
Wyoming Big Sagebrush	46.5	3.4	0.2	44.6	0.2	1.6	3.5
Seeding	50.4	0	0.1	46.4	0	1.4	1.7

* 'Bare Soil' refers to the lack of any other soil surface at the point of observation and does not take into consideration whether vegetation occurred directly above (vegetation cover is referred to in this evaluation as 'ground cover').
** The average soil surface calculations for Black Sagebrush Communities do not equal 100 percent.

Potential non-sagebrush rangeland communities – greasewood and winterfat communities – comprise less than 1 percent of the Cave Valley Watershed (Map 2, Figure 2.1 in Standard 2). Current estimates of total ground cover for greasewood and winterfat communities compared to ecological site description standards are summarized in Table 1.8. The average total ground cover for both communities exceeds the described standards.

Table 1.8. Comparison of Average Percent Ground Cover with the Ecological Site Descriptions' Standards for Non-Sagebrush Rangeland Communities in the Cave Valley Watershed.

Non-Sagebrush Rangeland Community Type	Total Sites	Estimated Ground Cover	*Standard Ground Cover*
Greasewood	3	54.3	***10-20***
Winterfat	1	24.0	***5-15***

If an increase in estimated ground cover coincides with an increase in shrub overstory and a decrease in herbaceous ground cover, especially fibrous-rooted perennial grasses, the erosion potential of a given site increases. Current estimates of the total ground cover broken down according to functional group composition for the sagebrush communities are summarized in Table 1.9. The standards as described in the ecological site descriptions are summarized in Table 1.10. For greasewood and winterfat communities, the shrub ground cover composition exceeds the described standards while the

herbaceous ground cover composition is far below the described standards. Neither of these communities meets the soils standard.

Table 1.9. Average Ground Cover Composition of Non-Sagebrush Rangeland Communities in the Cave Valley Watershed as Reported by Functional Groups and Cheatgrass.

Non-Sagebrush Rangeland	Total Sites	Trees	Shrubs	Grasses	Forbs	Cheat -grass
Community Type						
Greasewood	3	0	89.5	8.9	1.3	0.3
Winterfat	1	0	95.8	4.2	0	0

Table 1.10. Soils Standard: Average Percent-by-Weight Composition described in Ecological Site Descriptions for Non-Sagebrush Rangeland Communities as Reported by Functional Groups.

Non-Sagebrush Rangeland	Trees	Shrubs	Grasses	Forbs	Cheatgrass
Community Type					
Greasewood	***0***	***70-75***	***20-25***	***5***	***0***
Winterfat	***0***	***65***	***30***	***5***	***0***

In addition to canopy cover and understory ground cover composition, data was collected to estimate the soil surface composition of non-sagebrush rangeland communities in the Cave Valley Watershed (Table 1.11). No standard exists for comparing the estimates of current conditions for soil surfaces. The soil surface for both greasewood and winterfat communities in the Cave Valley Watershed is dominated by bare soil and litter with very little or no biological soil crusts present.

Table 1.11. Current Estimates of Average Soil Surface Composition for Non-Sagebrush Rangeland Communities in the Cave Valley Watershed.

Non-Sagebrush Rangeland CommunityType	*Bare Soil	Biotic Crust	Lichen	Litter	Moss	Plant	Rock
Greasewood	31.9	4.8	0	61.7	0.3	1.3	0
Winterfat	67.0	0.5	0	29.5	0	3.0	0

* 'Bare Soil' refers to the lack of any other soil surface at the point of observation and does not take into consideration whether vegetation occurred directly above (vegetation cover is referred to in this evaluation as 'ground cover').

Roads

According to data evaluated from a recent road inventory, the road density for the Cave Valley Watershed is 1.2 miles of road per square mile. There are 447 miles of inventoried roads covering a total of 358 square miles within the watershed. Many of these roads are recent developments and have been pioneered as a result of increased use of public lands for off-highway vehicle use. Many roads or trails run counter to the slope and act as berms capturing sheet flow from runoff and snowmelt and converting it into channel flow along the roads. This causes accelerated erosion where roads capture water flow in this manner.

There are approximately 6 miles of inventoried roads and trails that intersect sensitive soils within the watershed. These soils are associated with winterfat communities and have low shear strength that causes them to "powder out" and erode with increased traffic.

Causal Factors

The causal factors for the Cave Valley Watershed not meeting the Soils Standard are derived from many interrelated issues, many of the same factors that affect the majority of the Great Basin ecological province. Based on scientific research, there is a consensus that the alteration of Great Basin ecosystems and their historical natural disturbance regimes includes the following landscape-scale causes:

- Historic grazing practices in the wake of European settlement of the West;
- Increasingly effective fire suppression and control in last century;
- The introduction and spread of non-native annual grasses; and
- Climate fluctuations (drought) in recent years.

Causal factors for soil degradation are also site-specific.

- Ungulates such as wild horses and elk are contributing to the degradation of the hydrological function of soils in localized areas, especially near water sources.
- Roads and trails also cause accelerated soil erosion. Historically, travel routes evolved in a watershed as a result of needs for access which did not consider or reflect watershed function. This resulted in the construction of numerous, straight, steep roads that increase erosion potential and roads through sensitive (highly erosive) soils. Current road inventory indicates high road density in localized areas.

Recommendations

- Develop restoration strategy to implement restoration treatments with the objective of increasing herbaceous cover and decreasing spread of annual grasses as economically and ecologically feasible. Treatments used should include a variety of mechanical, chemical and prescribed-burn pinyon-juniper and brush removal methods as well as native grass seedings and/or transitional non-native seedings to increase herbaceous ground cover.
- Adhere to and continue to review wildfire management strategy.
- Perform dynamic livestock management that adheres to standards and guidelines that maintain soil function.
- Continue management of wild horse herds
- Where feasible, build protective fences around riparian areas.
- Develop a transportation plan to address improvement of road locations, closure of roads, and prevent the creation of new roads.

"STANDARD 2. ECOSYSTEM COMPONENTS:

Watersheds should possess the necessary ecological components to achieve state water quality criteria, maintain ecological processes, and sustain appropriate uses.

Riparian and wetlands vegetation should have structural and species diversity characteristic of the stage of the stream channel succession in order to provide forage and cover, capture sediment, and capture, retain, and safely release water (watershed function).

Upland indicators:

- Canopy and ground cover, including litter, live vegetation, biological crust, and rock appropriate to the potential of the ecological site;
- Ecological processes are adequate for the vegetation communities.

Riparian indicators:

- Stream side riparian areas are functioning properly when adequate vegetation, large woody debris, or rock is present to dissipate stream energy associated with high water flows.
- Elements indicating proper functioning condition such as avoiding accelerating erosion, capturing sediment, and providing for groundwater recharge and release are determined by the following measurements as appropriate to the site characteristics:
    - Width/Depth ratio;
    - Channel roughness;
    - Sinuosity of stream channel;
    - Bank stability;
    - Vegetative cover (amount, spacing, life form); and
    - Other cover (large woody debris, rock).
- Natural springs, seeps, and marsh areas are functioning properly when adequate vegetation is present to facilitate water retention, filtering, and release as indicated by plant species and cover appropriate to the site characteristics.

Water quality indicators:

- Chemical, physical and biological water constituents are not exceeding the state water quality standards."

Upland Standards

The analysis and interpretation of the findings by the Cave Valley watershed evaluation ID Team indicates this standard is not being achieved. Line point-intercept cover data and Fire Regime and Condition Class (FRCC) were analyzed and interpreted.

Figure 2.1. Potential Major Vegetation in the Cave Valley Watershed as Estimated from Soil Survey Data.

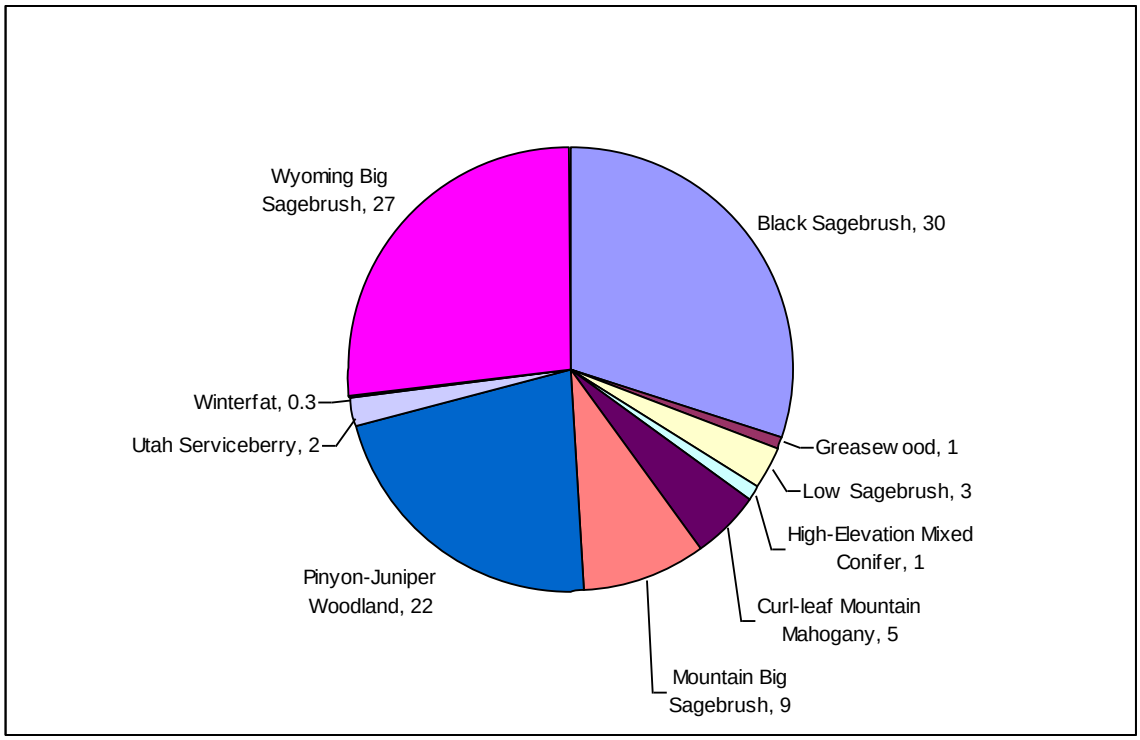

Figure 2.1 depicts the proportion of the watershed that has the potential for each major vegetation community to be present. The potential vegetation communities for Cave Valley Watershed were estimated by assuming the dominant vegetation for a given soil map unit represented the vegetation for the entire area in the soil map unit. The potential vegetation estimated for a given area does not necessarily reflect the actual vegetation present at sites visited by field crews. Potential high-elevation conifer communities (2,904 acres or 1% of watershed) and potential Utah serviceberry communities (3,630 acres or 2% of watershed) were not encountered by field crews during the 2007 field season. Data for these communities were not collected and the communities were not characterized at this scale of analysis. These communities will, however, be assessed at a smaller scale where they pertain to more site-specific needs associated with pre-monitoring ahead of project level implementation.

Potential pinyon-juniper woodlands comprise approximately 50,934 acres (22 %) of the watershed (Map 2, Figure 2.1). Current estimates of the tree canopy cover and understory composition for pinyon-juniper woodlands are summarized in Table 2.1. The standards as described in the ecological site descriptions are summarized in Table 2.2. Current estimates from professional observations indicate that the pinyon-juniper woodlands are meeting the upland standard with an average canopy cover of 33 percent.

The herbaceous component of understory ground cover composition in pinyon-juniper woodlands does not meet the upland standard. The understory composition of shrubs is within the ideal range described in the ecological site descriptions. The understory

composition of native grasses and forbs, however, are slightly below the ideal range described. This may be partly due to the presence of cheatgrass, which comprises an average of 19.5 percent of the understory.

The above interpretation of pinyon-juniper woodland data may lead to an incorrect conclusion since juniper savannahs, for which the rangeland ecological site descriptions indicate an average overstory canopy of less than 10 percent, were included in the pinyon-juniper woodlands analysis. When considered separately, the average canopy cover observed for pinyon-juniper woodlands is 40 percent and the average canopy cover observed for juniper savannahs is 15.5 percent (see Table 2.1). Neither pinyon-juniper woodlands nor juniper savannahs meet the upland standard when considered separately. However, the juniper savannah community type was included as part of the pinyon-juniper woodlands communities in the estimation of potential vegetation communities for the watershed. Since this evaluation requires an average estimate of cover for such a broad grouping, one may conclude that some woodland areas may be meeting the upland standard while other areas are not meeting the standard.

Table 2.1. Comparison of Average Current Condition Estimates of Pinyon and/or Juniper Communities in the Cave Valley watershed as Reported by Functional Groups and Cheatgrass Cover.

Woodland Community	**Total Sites**	**Overstory**	**Understory Ground Cover Composition**			
Type		**Canopy Cover**	**Shrubs**	**Grasses**	**Forbs**	**Cheatgrass**
Juniper Savannah	8	16	46	30.2	4.6	19.2
Pinyon-Juniper Woodland	22	40	41	32	7	20
Savannah and Woodland Combined	30	33	43	31.5	6	19.5

Table 2.2. Uplands Standard: Average Tree Canopy Cover and Percent of Total Understory Ground Cover Composition from Ecological Site Descriptions for Pinyon and/or Juniper communities Reported by Functional Groups.

Woodland Community	**Overstory**	**Understory Ground Cover Composition**			
Type	**Canopy Cover**	**Shrubs**	**Grasses**	**Forbs**	**Cheatgrass**
Juniper Savannah	***< 10***	***53-58***	***37-41***	***5-6***	***0***
Pinyon-Juniper Woodland	***20-35***	***30-50***	***35-60***	***10-20***	***0***

Potential curl-leaf mountain mahogany woodlands make up 10,464 acres (5%) of the Cave Valley Watershed. Ecological site descriptions indicate the average overstory

canopy in curl-leaf mountain mahogany woodlands should be 35 to 50 percent with curl-leaf mountain mahogany composing nearly the entire overstory canopy. Current estimates indicate that the mountain mahogany woodlands are meeting the upland standard with an average canopy cover of 31 percent. According to field observations, 95 percent of the overstory canopy is composed of curl-leaf mountain mahogany.

The understory functional group composition for curl-leaf mountain mahogany woodlands does not meet the described standards as a whole. The average shrub ground cover composition (40.5 percent) was higher than the described standards (35 percent). The herbaceous ground cover composition was much lower than the standards with basal and foliar grass ground cover comprising 33.5 percent of the understory and foliar forb ground cover comprising 7.5 percent of the understory. The described standard for grass percent-by-weight composition is 55 percent and for forb percent-by-weight composition is 10 percent. The lower herbaceous ground cover may be due to the prevalence of cheatgrass within these communities which comprise 18.5 percent of the total understory ground cover.

Potential sagebrush communities make up about 158,897 acres (69.5 %) of the Cave Valley Watershed (Map 2, Figure 2.1). Tables 2.3 and 2.4 summarize the percent cover composition for the individual sagebrush communities inside and outside seedings, respectively. Table 2.5 summarizes the upland standards as described in the ecological site descriptions for the sagebrush communities. The percent tree canopy cover composition for all sagebrush communities exceeds the described standards. Pinyon and/or juniper trees are most prevalent in the black sagebrush, low sagebrush, and mountain big sagebrush types with higher tree canopy cover in sagebrush communities within close proximity to pinyon-juniper woodlands.

Shrub ground cover composition in the basin big sagebrush, mountain big sagebrush, and Wyoming big sagebrush types exceeds the described standards. This does not meet the upland standard for these communities. In black sagebrush and Wyoming big sagebrush types inside seedings as well as low sagebrush types, the shrub ground cover composition is less than that described in the ecological site descriptions.

For all of the sagebrush communities evaluated, basal and foliar grass ground cover and foliar forb ground cover are less than the average composition described in the ecological site descriptions. Wyoming big sagebrush communities inside seedings have a higher basal and foliar grass cover than the standard due to the prevalence of crested wheatgrass. Cheatgrass is present in all sagebrush types. Cheatgrass prevalence tends to be site-specific with very high percent cover present at several sites and low or no cover at the majority of the sites visited.

Table 2.3. Comparison of Current Condition Estimates of Sagebrush Communities inside seedings in the Cave Valley Watershed from Average Ground Cover Composition as Reported by Functional Groups and Cheatgrass.

Sagebrush Community Type	Total Sites	Trees	Shrubs	Grasses	Forbs	Cheatgrass
Black Sagebrush	1	25.8	29.5	29.5	0.1	15.1
Wyoming Big Sagebrush	5	0	36.4	58.4	3.4	1.8

Table 2.4. Current Condition Estimates of Sagebrush Communities outside seedings in the Cave Valley Watershed from Average Percent Ground Cover Composition as Reported by Functional Groups with Cheatgrass Cover.

Sagebrush Community Type	Total Sites	Trees	Shrubs	Grasses	Forbs	Cheatgrass
Basin Big Sagebrush	2	4.9	60.2	30	0.3	4.6
Black Sagebrush	22	16.1	45.8	23.4	3.3	11.4
Low Sagebrush	2	18.9	35.9	27.6	2.0	15.6
Mountain Big Sagebrush	11	11.8	47.8	24	3.4	13.0
Wyoming Big Sagebrush	27	6.2	73.7	14.3	2.8	8.9

Table 2.5. Uplands Standard: Average Percent-by-Weight Composition described in Ecological Site Descriptions for Sagebrush communities as Reported by Functional Groups.

Sagebrush Community Type	Trees	Shrubs	Grasses	Forbs	Cheatgrass
Basin Big Sagebrush	***0-3***	***10-25***	***65-85***	***5-10***	***0***
Black Sagebrush	***0-5***	***45****	***50****	***5***	***0***
Low Sagebrush	***0-2***	***40-45***	***45-50***	***10***	***0***
Mountain Big Sagebrush	***0-3***	***30****	***60****	***5-10***	***0***
Wyoming Big Sagebrush	***0-3***	***50****	***45****	***5***	***0***

* Starred functional group standards are averages of the reported values in the ecological site descriptions for the sagebrush communities being described.

Non-sagebrush rangeland communities comprise less than 1 percent of the watershed with potential greasewood communities occupying approximately 1,123 acres (0.5%) of the watershed and potential winterfat communities occupying approximately 610 acres (0.3%) of the watershed (Map 2, Figure 2.1). Table 2.6 summarizes the current condition estimates for both of these communities. The standards as described in the ecological site descriptions are summarized in Table 2.7.

Neither pinyon nor juniper trees are present in either of these community types, which correspond with the ecological site descriptions and the location of both communities in the valley bottom rather than adjacent to pinyon-juniper woodlands. The shrub composition for both communities exceeds the ideal composition described in the ecological site descriptions. Alternately, both the basal and foliar grass cover composition and foliar forb cover composition are less than the ideal composition described. Neither of these conditions meets the upland standards for these communities. Cheatgrass cover composition is very low in the greasewood communities while completely absent in the winterfat communities.

Table 2.6. Comparison of Current Condition Estimates of Non-Sagebrush Rangeland Communities in the Cave Valley Watershed from Average Ground Cover Composition ad Reported by Functional Groups and Cheatgrass.

Non-Sagebrush Rangeland	Total Sites	Trees	Shrubs	Grasses	Forbs	Cheatgrass
Community Type						
Greasewood	3	0	89.5	8.9	1.3	0.3
Winterfat	1	0	95.8	4.2	0	0

Table 2.7. Average Percent-by-Weight Composition described in Ecological Site Descriptions for Non-Sagebrush Rangeland Communities as Reported by Functional Groups.

Non-Sagebrush Rangeland	Trees	Shrubs	Grasses	Forbs	Cheatgrass
Community Type					
Greasewood	***0***	***70-75***	***20-25***	***5***	***0***
Winterfat	***0***	***65***	***30***	***5***	***0***

Fire History and Fire Regime and Condition Class

Fire statistics:

Over the past 27 years, there have been 62 fires recorded ranging from spot fires to 1700 acres. The watershed averaged 2.3 fires per year. Total acreage burned is approximately 4200 acres.

Fire Regime Condition Class (FRCC) Analysis:

Another method of assessing ecological condition is using the FRCC Mapping Tool (developed by the USDA Forest Service for the National Interagency Fuels Coordination Group, NIFTT). The analysis quantifies the departure of current vegetation conditions

from a set of reference conditions. It is not a fire risk or fuels hazard assessment. Data used to perform the analysis is provided by LANDFIRE (Landscape Fire and Resource Management Planning Tools Project), an interagency vegetation, fire, and fuel characteristics mapping project. (See http://www.landfire.gov). FRCC analysis of Cave Valley is summarized below in Table 2.8.

Table 2.8. Fire Regime Condition Class Descriptions and Proportion of the Meadow Valley Wash North and South Watersheds categorized within each condition class.

Class	Class Description	Proportion of Watershed
1	Fire regimes are within the natural or historical range of variation and risk of losing key ecosystem components is low. Vegetation attributes (composition and structure) are intact and functioning.	24 %
2	Fire regimes have been moderately altered. Risk of losing key ecosystem components is moderate. Fire frequencies may have departed by one or more return intervals (either increased or decreased), potentially resulting in moderate changes in fire and vegetation attributes	37 %
3	Fire regimes have been substantially altered. Risk of losing key ecosystem components is high. Fire frequencies may have departed by multiple return intervals, potentially resulting in dramatic changes in fire, fire intensity and severity as well as landscape patterns. Vegetation attributes have been substantially altered.	39 %
None	Consists of rocks, water, bare ground, agriculture, etc.	<1 %

Seventy-seven percent of the watershed is in Condition Class 2 or 3. This may infer that 77 percent of the watershed is not meeting the Upland Standard or Habitat Standard.

Riparian Standards

The analysis and interpretation of the findings by the Cave Valley watershed evaluation ID Team indicates this standard is not being achieved. Formal Proper Functioning Condition (PFC) assessments have been performed for 25 lentic sites in the Cave Valley Watershed during 2007. Only a select number of lentic riparian sites were chosen for evaluation. The sites at which PFC assessments were performed were selected due to the increased potential for these sites to be impacted by livestock, wild horse, and wildlife use.

Figure 2.2. Percentage of Lentic Riparian Systems within each Condition Class Assessed for Proper Functioning Condition in the Cave Valley Watershed.

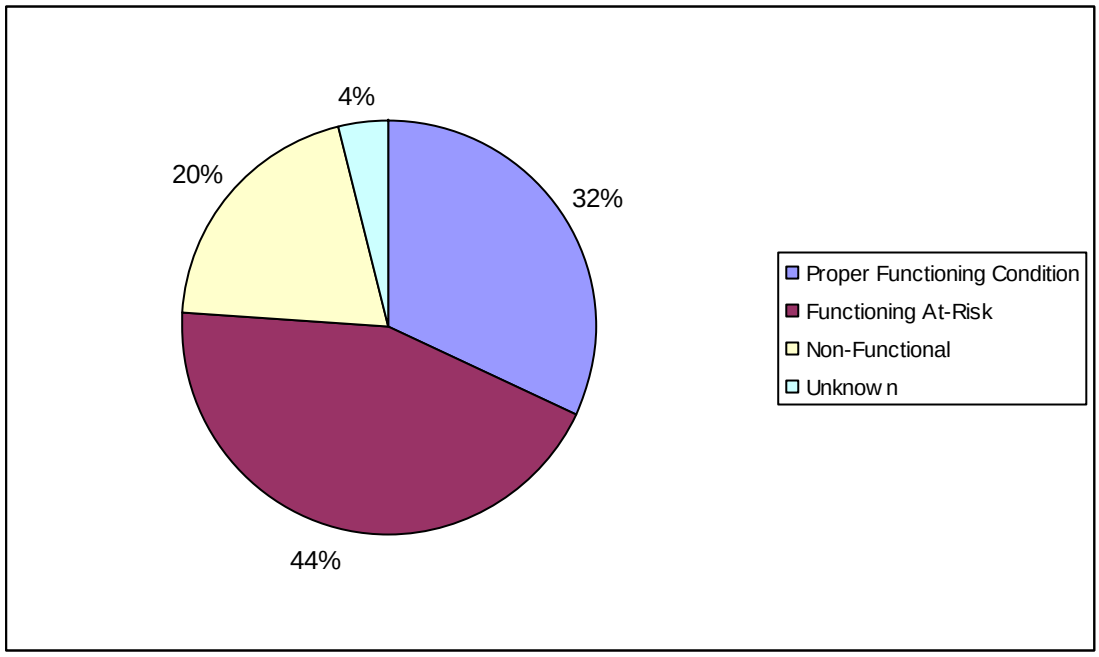

Figure 2.2 depicts the condition class distribution for the lentic sites assessed for PFC in the Cave Valley Watershed. The indicator data evaluated for the lentic riparian systems show 8 of the 25 sites are functioning properly. Of the remaining sites, 11 were determined to be functioning at-risk with a downward trend and 5 (five) were determined to be non-functional. One lentic site's status was unable to be determined at the time of the assessment.

The primary cause listed for four of the five non-functioning lentic sites is watershed condition. Two of the sites are experiencing pinyon-juniper encroachment into the hydric soils zone and one site is being heavily overgrazed. The other two springs have been developed or diverted to the point where the natural spring habitat is diminished or no longer in existence.

For the sites assessed as functioning-at-risk with a downward trend, the primary causes listed for the reduced function include unsustainable livestock use (2 springs) and the shrinkage of hydric soils habitat due to alterations for diversions (5 springs), prolonged drought (3 springs), and pinyon-juniper encroachment (1 spring). Of the 9 springs not directly affected by livestock use, the detrimental effects at 8 springs are being exacerbated by unsustainable livestock use. This may be due to continued use of the riparian areas during a prolonged drought when the systems are already stressed.

Most of the springs have been nearly or completely denuded from overgrazing as they are probably being targeted by livestock and wildlife in landscapes largely devoid of upland forage. The elimination of spring bank and spring brook vegetation increases the

potential for the banks to erode, further degrading the function of the systems. One recommendation made in one of the assessments that may be appropriate for many of the functioning-at-risk systems includes protecting the spring with fencing and allowing the system to rest for several wet seasons. The rest period would allow riparian species to recover and re-vegetate the springs' habitats.

Other Areas of Concern for Cave Valley Watershed

Weeds

The BLM defines a weed as a non native plant that disrupts or has the potential to disrupt or alter the natural ecosystem function, composition and diversity of the site it occupies. A weeds presence deteriorates the health of the site, it makes efficient use of natural resources difficult, and it may interfere with management objectives for that site. It is an invasive species that requires a concerted effort (manpower and resources) to remove from its current location, if it can be removed at all. "Noxious" weeds refer to those plant species which have been legally designated as unwanted or undesirable. This includes national, state and county or local designations.

Noxious weed inventories are typically performed using the Tier 1 methods delineated by the Nevada Invasive Weed Survey Protocol. Baseline weed inventories are performed along travel corridors, waterways, and man-made or natural disturbed areas as these areas are regularly disturbed where weed infestations are most likely to occur. All of the weed infestations inventoried in the watershed are associated with travel corridors and typically occur at heavily traversed road intersections.

A total of 21 weed infestations have been mapped in the Cave Valley Watershed with 20 mapped in the upland sites and 1 mapped within 25 feet of a water source, possibly a trough, in the watershed. Thirteen (13) of the 21 infestations are on private land but all of these are located in the BLM rights-of-way of public roads.

Weed species are more likely to spread along road rights-of-way because there are more vectors (humans and vehicles) to transport weeds and there are more disturbed areas with less resilient native vegetation in which noxious weeds can thrive. Weed propagules are transported by humans and vehicles when the propagules are caught on vehicle tires, bumpers, undercarriages, shoes, clothing, and other equipment and are then transported to other disturbed areas.

The infestations inventoried in the watershed include whitetop (*Cardaria draba*), Russian knapweed (*Acroptilon repens*), and bull thistle (*Cirsium vulgare*). The dominant weed is whitetop with 19 infestations covering approximately 14,800 square feet in the watershed. Use of integrated pest management practices - including chemical, mechanical, and cultural control – can be successful in controlling weed infestations. All of these infestations have been treated between 2004 and 2007.

Cheatgrass (*Bromus tectorum*) is also present in the watershed. Cheatgrass is a highly invasive non-native annual grass that out-competes native vegetation for resources by sprouting earlier. Cheatgrass is also known to change the fire regimes of entire plant communities. Due to the high prevalence and naturalization of cheatgrass throughout the State of Nevada as well as the difficulty in removing the species from plant communities once introduced, cheatgrass has not been included on the state noxious weed list and is not controlled. Infestations are typically not mapped given the widespread distribution of the species.

Minerals Disturbance on Public Land

There are 2 mining districts within the watershed, Silver King Mine and the Pole Project. The Silver King Mine disturbances occur on public land. Currently there are partially re-claimed disturbances from the original mine and a plugged adit. Renewed drilling exploration has been proposed. The Pole Project was an exploration on the east side of the watershed with 2 acres of reclaimed disturbances, last worked in 1985 and reclaimed in 1987.

There are no oil and gas pads in this watershed. There are no inventoried gravel pits in this watershed.

Rights-of-Way (ROW's)

ROW's are subject to the Terms and Conditions of the grant. Mitigation measures include but are not limited to, weed treatment/mitigation, re-vegetation of surface disturbance and following the 9100 Engineering Guide to road building standards.

Not all acres within a ROW are used in surface disturbing activities. For example, a telephone line may be 25 feet wide, but only 10 feet of the 25 feet was disturbed during construction. Also, those areas with buried lines should be successfully rehabilitated and/or re-vegetated.

Causal Factors for Upland and Riparian Standards

The causal factors for the Cave Valley Watershed not meeting the Upland and Riparian Standards can also be attributed to many of the same causal factors for not meeting Soil Standards:

- The introduction and spread of non-native annual grasses is an indicator for not meeting the Standard;
- Proliferation of invasive annual flammable grasses.
- Historic grazing practices in the wake of European settlement of the West; and

- Increasingly effective fire suppression and control in last century

In addition to the aforementioned causal factors, several factors not mentioned in the Soils Standards may be attributed to Upland and Riparian sites.

- Riparian proper function and condition: Livestock, wild horses and elk are contributing factors to decreased herbaceous cover around many of the riparian ecological zones evaluated as "functioning-at-risk" or "non-functioning". Changes in riparian zone ecological function is also directly attributed to pinyon-juniper tree encroachment and expansion, drought, as well as obstructions and diversions of springs and stream flow.
- Weeds: As human population increases, weed vectors increase (humans and vehicles) and exacerbate distribution of weed seeds along roadways and trails. Livestock on uplands and riparian areas increase distribution and establishment of weed seeds, including cheatgrass. Extensive weed inventories have not been executed in the Cave Valley Watershed at the time of this report.

Recommendations

- Develop restoration strategy for the watershed and apply restoration treatments with the objective of increasing herbaceous cover and decreasing the spread of annual grasses as economically and ecologically feasible. Treatments used should include a variety of mechanical, chemical and prescribed-burn pinyon-juniper and brush removal methods as well as native grass seedings and/or transitional non-native seedings to increase herbaceous ground cover.
- Adhere to and continue to review wildfire management strategy.
- Maintain livestock management that adheres to standards and guidelines that supports ecological sustainability.
- Continue management of wild horse herds.
- Where feasible, build protective fences around riparian areas.
- Visit all seeps, springs, wetlands and streams that have been evaluated as functioning-at-risk and non-functioning PFC to plan for water source improvements.
- Increase weed inventories and treatments throughout the Cave Valley Watershed.

"Standard 3. HABITAT AND BIOTA: Habitats and watersheds should sustain a level of biodiversity appropriate for the area and conducive to appropriate uses. Habitats of special status species should be able to sustain viable populations of those species.

Habitat indicators:

- Vegetation composition (relative abundance of species);
- Vegetation structure (life forms, cover, heights, or age classes);
- Vegetation distribution (patchiness, corridors);
- Vegetation productivity; and Vegetation nutritional value.

Wildlife indicators:

- Escape terrain;
- Relative abundance;
- Composition;
- Distribution;
- Nutritional value; and
- Edge-patch snags."

The analysis and interpretation of the findings by the Watershed ID Team indicates the habitat standard is not being partially achieved in uplands and partially achieved in riparian areas. This standard is similar to Standard two, but considers the assessment data in terms of the indicators as given in the Habitat standard and in terms of animal species habitat needs. The current habitat condition was compared to ecological site descriptions and to habitat composition within an ecological state, across the landscape in terms of the necessary structure of the state, and to transition models. These percentages reflect needs in animal species habitats associated with Great Basin sagebrush grassland semi-desert – basin big sagebrush, black sagebrush, and Wyoming big sagebrush – as well as greasewood and winterfat; mountain brush habitats including low sagebrush, mountain big sagebrush, Utah serviceberry, and mountain mahogany; woodland habitats including pinyon and/or juniper woodlands and mixed conifer and aspen at higher elevations; and riparian areas including wet meadows and riparian aspen or chokecherry.

The primary large wildlife species habitat managed for in the Cave Valley Watershed include pronghorn antelope (*Antilocarpa americana*), mule deer (*Odocoileus hemionus*), Rocky Mountain elk (*Cervus canadensis*), and bighorn sheep (*Ovis canadensis).*

Cave Valley Watershed includes the northern range desert bighorn sheep (*Ovis canadensis nelsonii*) and the southern range of Rocky Mountain bighorn sheep (*Ovisc canadensis).* Primary Rocky Mountain bighorn sheep forage includes grasses, grass-like plants, forbs, and shrubs. Nevada Department of Wildlife (NDOW) reintroduced twelve populations of Rocky Mountain bighorn sheep in the Mount Grafton area in the late 1980s. However, that population is considered limited. Desert bighorn sheep require access to freestanding water during the summer months, and throughout the year during drought conditions. A wildlife water development designed for bighorn sheep use was installed in the southern high elevations. The diet of desert bighorn sheep consists primarily of grasses, shrubs, and forbs. The Egan Range, along the west side of Cave Valley, currently supports a relatively stable population of desert bighorn sheep. Bighorn

sheep are identified as occupying 49,806 acres, with an additional 138,764 acres of potential habitat unoccupied.

Rocky Mountain elk occur in a wide variety of habitats within Cave Valley, from low to upper elevations. There are a total of 159,829 acres of yearlong elk habitat within the watershed. In addition, the 6,066 acres of summer range includes ponderosa pine, white fir, mixed conifer, Engelmann spruce, aspen, and higher elevation pinyon-juniper woodlands and meadows above 6,200 feet in elevation. The 65,584 acres of winter range consists primarily of pinyon-juniper woodlands and sagebrush-grasslands between 5,000 and 9,500 feet in elevation. Pinyon-juniper, aspen, mixed-conifer forests, and mountain mahogany provide thermal and escape cover. Shrub species, including antelope bitterbrush and sagebrush, also provide important cover and forage for elk. Although elk forage largely on grass species, they also consume a wide variety of forbs and shrubs. The watershed's northern wildlife water development was designed for elk.

Mule deer are widespread within the planning area and typically are associated with middle to upper elevations. Habitat for mule deer within Cave Valley includes big sagebrush, low sagebrush, shadscale, and grasslands. Deer generally are classified as browsers, foraging primarily on forbs and shrubs. However, the importance of forage type tends to vary by season and climate. Forbs and grasses are an integral part of the mule deer diet during the spring and fall growth seasons when succulence is greatest. Shrubs are utilized more heavily during dry summer and winter periods. Important forage on range for mule deer includes snowberry, sagebrush, serviceberry, antelope bitterbrush, and mountain mahogany. Mountain mahogany and pinyon-juniper woodlands are important for thermal and escape cover during winter. During summer, mule deer tend to rely on riparian and mountain sagebrush communities. Within Cave Valley, there are 3,724 acres of yearlong habitat for deer, as well as 54,544 acres of summer range and 116,945 acres of winter range.

Pronghorn prefer gently rolling to flat topography that provides good visibility of the surrounding area, primarily Great Basin sagebrush/ grassland habitat type. Pronghorn diet consists of grasses, forbs, and browse plants. Sagebrush is important for both food and cover. Other important forage species include antelope bitterbrush, saltbush, rabbitbrush, cheatgrass, Indian ricegrass, and shadscale. During the summer, pronghorn are widely distributed throughout the valleys and mountain foothills and primarily are associated with low sagebrush habitat with mixed vegetation including grasses, forbs, and shrubs. The watershed provides 48,328 acres of pronghorn habitat, of which none is identified as crucial winter range.

Although differing in their specific preferred browse, areas of seasonal use, and optimal habitat needs, to adequately sustain desired herd levels for all these species, the primary habitat management goal is a mosaic of healthy and diverse vegetative types. While the crested wheatgrass seedings historically planted in some of the valley bottom have nutritional value to wildlife, type conversion has resulted in the loss of preferred native wildlife forage plants and overall negative impacts on wildlife habitat. Pinyon-juniper trees provide important thermal cover, but this increasing establishment of woody species within ecological conditions that typically support shrub-dominated and grassland

communities, has decreased herbaceous understory in terms of reduced plant productivity and diversity. Although these trends benefit species that occur primarily in woodland habitats, these trends also lead to loss in forage (grass and forb) production within dense stands and a reduction of species diversity. Degraded habitat conditions due to pinyon-juniper invasion and decadent or senescent mountain brush communities across some areas of the watershed may impact the herds' full potential. In addition, cheatgrass and other invasive plants occupy many acres of Cave Valley's sagebrush steppe.

Potential sagebrush communities comprise the majority of Cave Valley, approximately 69 percent. Although several wildlife species are dependent on the presence of sagebrush for survival, information concerning many of these species, their specific habitat needs, and precise distribution within the watershed is generally poor. A notable exception is sage grouse (*Centrocercus urophasianus*), of which there is considerable knowledge of their habitat requirements in comparison with other sagebrush obligates. Given the information and since sage grouse require large areas of sagebrush to survive, they may be considered an indicator species with the assumption that their habitat needs and relative condition may be extrapolated to other sagebrush obligates. In some cases, these other sagebrush obligates will have habitat needs in addition to what is desired for sage grouse. While those additional species' specific population distributions and needs surveys and studies are needed, they have not been completed.

Cave Valley Watershed is entirely within Cave Valley Sage Grouse Population Management Units (PMU) and is a key area yearlong for sage grouse. Within this watershed, there are ten known active leks. Preferred lek habitat includes primarily shorter vegetation, with taller, more robust sagebrush within 300 to 700 feet for escape cover, and no trees or other raptor perches within five miles of the grounds. The valley holds a mosaic of different types of sagebrush that serve as nesting and wintering habitat. Meadows at the north end of the valley and a number of small springs or riparian areas include the majority of the brood-rearing areas. Optimal sage grouse habitat is in the range of 15 to 25 percent sagebrush canopy cover and an abundant, healthy, diverse herbaceous understory. For nesting and spring habitat, the understory would be fifteen percent grass and ten percent forbs. Cave Valley includes 94,174 acres of sage grouse nesting/early brood-rearing habitat, 195,615 acres summer (late brood-rearing) habitat, 84,100 acres of winter habitat and 109,989 acres of key yearlong habitat.

The Cave Valley sagebrush communities average 29.5 to 73.7 percent ground cover and lack vegetative composition (see Tables 2.3-2.7 and pages 21 to 23), thereby exceedingly ecological site descriptions and preferred sage grouse habitat standards. Some areas of stagnant sagebrush exist with little or no understory vegetation. Expansion of pinyon-juniper into sagebrush communities has fragmented and degraded the quality of sage grouse habitat, reducing perennial grass cover, forb composition, and diversity as well as reducing the productivity of water sources. Pinyon–juniper trees in sagebrush communities, fences, powerlines, windmills, and other structures all provide perches for raptors and corvids, thereby increasing the potential for predation. Such structures have a greater negative impact when located near sage grouse leks.

Within the watershed, there are no known populations of any currently federally listed threatened or endangered species or Nevada BLM Sensitive Species according to Nevada Natural Heritage Program.

A number of migratory bird species have distributions which overlap with Cave Valley. Based on known habitat associations, migratory bird species composition may be somewhat anticipated. Some of the more common bird species that would be expected to occur within the watershed include a wide range of neotropical migrant species including sagebrush shrubland species such as the sage thrasher, sage sparrow, and Brewer's sparrow; shrubland species such as the black-throated sparrow and lark sparrow; shrubland-grassland species such as the loggerhead shrike; grassland species such as the vesper sparrow; dry woodland species such as the gray flycatcher; riparian species such as the orange-crowned warbler and yellowbreasted chat; and pinyon-juniper woodland species such as the pinyon jay, gray vireo, juniper titmouse, black-throated gray warbler, and ferruginous hawk. These bird species are considered integral to natural communities and commonly are viewed as environmental indicators based on their sensitivity to environmental changes caused by human activities.

Migratory bird nesting and foraging habitats may be located throughout the watershed, with certain species adapted to specific habitat types. Changes in habitat condition and abundance may result in increases in the populations of some bird species at the expense of other bird species. Thus, there is no change that will benefit or adversely affect all migratory bird species. As such, the preferred management goal is to manage for a healthy and diverse mosaic of vegetative habitat types.

The analysis and interpretation of the findings by the Watershed ID Team indicates the habitat standard is not being partially achieved in uplands and partially achieved in riparian areas. Indicators on vegetation composition and productivity are not consistent with ecological site description productivity parameters or cover composition parameters or habitat composition and structure across landscapes. Cover data, FRCC data, and riparian PFC assessment data was discussed in the upland and riparian standards findings.

The habitat standard for woodland is being partially achieved. This is not being achieved in areas of over-mature woodlands (pinyon-juniper) as indicated by excessive canopy cover.

The habitat standard for sagebrush is not being achieved. Many sagebrush habitats exhibit minimal herbaceous understory with increasing sagebrush and pinyon-juniper canopy cover, thereby not meeting habitat needs for sagebrush obligates species, including sage grouse.

The presence of cheatgrass does not meet the standard, since cheatgrass is an invasive species which readily displaces native vegetation and alters the fire return interval, causing loss of native vegetation and reduced food and cover availability for numerous species.

The habitat standard for riparian habitats is being partially met as areas vary from functioning to functioning-at-risk to non-functioning. Degradation of riparian areas negatively impacts all wildlife species by reducing available food, water and cover.

Cave Valley Watershed Wildlife Data Summary*

Sage Grouse:
Year Long- 109,989 ac
Winter- 84,100 ac
Late Summer- 195,615 ac
Nesting- 94,174 ac
Active Leks- 10

Big Game:
Deer:
Winter- 116,945 ac
Summer- 54,544 ac
Yearlong - 3,724 ac
Pronghorn:
Crucial Winter- 0 ac
Yearlong- 48,328 ac
Elk:
Winter- 65,584 ac
Summer- 6,066 ac
Yearlong- 159,829 ac
Bighorn Sheep:
Occupied- 49,806 ac
Unoccupied- 38,764 ac

Raptors:
none

Species of Special Concern:

Threatened or Endangered:
none

Nevada BLM Sensitive Species:
none

** Data extracted from Nevada Department of Wildlife (NDOW) and Nevada Natural Heritage program computer databases*.

Other Areas of Concern

Weeds

A total of 21 weed infestations have been mapped in the Cave Valley Watershed. The infestations inventoried in the watershed include whitetop (*Cardaria draba*), Russian knapweed (*Acroptilon repens*), and bull thistle (*Cirsium vulgare*). Cheatgrass (*Bromus tectorum*), an invasive non-native annual grass, is also present in the watershed but is neither inventoried nor controlled for reasons discussed in Standard 2. Ecosystem Components. Within areas infested by noxious weeds, the composition, structure, distribution, productivity, and nutritional value of vegetation is altered. The degree of

this alteration is dependent on the patch size, estimated cover values, and the specific infesting species.

Bull thistle is an aggressive weed that can form very dense stands along roadsides, fence lines, ditch banks, open dry areas and in pastures. While bull thistle is not listed in the State of Nevada as a noxious weed, it may impede water flow, crowd out native vegetation, and destroy wildlife habitat. Because of these impacts, bull thistle is inventoried and treated when it occurs in sensitive areas. Bull thistle is the easiest of the thistles to control. Within the watershed, there are three (3) bull thistle infestations in the watershed covering approximately 3,600 square feet. Two (2) of these infestations reside in the cover class of less than 2 percent and one (1) has a cover class of 2 to 25 percent. All infestations have been treated since 2004.

Russian knapweed readily establishes in a variety of disturbed sites and rarely invades resilient sites. Once established, it uses a combination of adventitious shoots and allelopathy to create monotypic stands. Although Russian knapweed is generally avoided by grazing animals, it is poisonous to horses and can cause chewing disease. Within the watersheds, two infestations of Russian knapweed have been inventoried in the watershed covering approximately 700 square feet. Both Russian knapweed infestations have a cover class of less than 2 percent. All infestations have been treated since 2004.

Whitetop displaces native vegetation, is toxic to horses, and can taint milk production in cattle. Large, clonal colonies can develop from creeping horizontal roots in a very short period of time. Whitetop reproduces from both seeds and root fragments and readily invade disturbed open sites as well as irrigated fields and pastures, roadsides, and ditches. Within the watersheds, 19 infestations of whitetop have been inventoried. Half of these infestations (9) have a cover class of less than 2 percent, six (6) have a cover class of 2 to 25 percent, and two (2) reside in the cover class 26 to 50 percent. No weeds were present at two of the locations during time of treatment. All infestations have been treated since 2004.

Causal Factors:

- Historic grazing practices in the wake of European settlement of the West
- Increasingly effective fire suppression and control in last century
- The introduction and spread of non-native annual grasses
- Climate change or drought conditions in recent years
- Localized overuse especially near water sources by livestock, wild horse and/or elk
- Improperly designed roads and density of roads in some areas
- Road density that creates fragmentation of habitat
- Weeds transported along travel corridors that get established and displace viable habitat

Recommendations:

- Develop watershed restoration strategy and apply restoration treatments with the objective of increasing herbaceous cover and decreasing the spread of annual grasses as economically and ecologically feasible. Treatments used should include a variety of mechanical, chemical and prescribed-burn pinyon-juniper and brush removal methods as well as native grass seedings and/or transitional non-native seedings to increase herbaceous ground cover.
- Continue monitoring wildlife populations.
- Perform dynamic livestock management that adheres to standards and guidelines that maintain ecological sustainability.
- Continue management of wild horse herds and wildlife. Where feasible, build horse and wildlife protective fences around riparian areas.

Standard 4. Wild Horses and Burros: Wild horses and burros within HMAs should be managed for herd viability and sustainability. HMAs should be managed to maintain a healthy ecological balance among wild horse and/or burro populations, wildlife, livestock, and vegetation.

Herd health indicators:

- General horse and/or burro appearance.
- Crippled or injured horses and/or burros.

Herd demographics indicators:

- Size of bands.
- Size of bachelor bands.

Herd viability indicators:

- Heavy trailing into water sources.
- Waiting for water.
- Availability of water.
- Depleted forage near all available water sources.

The management of the wild horse populations in the Cave Valley Watershed is currently meeting the described standards. The Dry Lake Wild Horse Herd Management Area (HMA) is the only HMA to occur in the Cave Valley Watershed. The Dry Lake HMA encompasses 487,800 acres and spans across portions of at least 4 different watersheds within the Ely BLM District, including the southern half of the Cave Valley Watershed. The herd sizes within the entire Dry Lake HMA are currently estimated as below the appropriate management level of 94 wild horses. The current condition of the Dry Lake HMA for forage, water, space, cover, and reproductive viability are all deemed adequate.

Causal Factors

- N/A

Recommendations

It has been recommended that the use of the Dry Lake HMA by wild horses be continued and the herd sizes be managed within the appropriate management level range for the HMA.

OHV ADMINSTRATION GUIDELINES FOR NEVADA PUBLIC LANDS as defined by the Nevada Northeastern Great Basin RAC and the Mojave-Southern Great Basin (RAC), as chartered by the Department of the Interior: "These guidelines are to be used to insure the protection of land health and the availability of the public lands for all multiple users" (RAC guidelines).

As defined by:

- On-the-ground management guidelines.
- Planning guidelines
- Education guidelines

OHV ADMINSTRATION GUIDELINE FOR NEVADA PUBLIC LANDS

- On-the-ground management guidelines.

The analysis and interpretation of OHV travel management by the Watershed ID Team indicates Resource Advisory Council (RAC) **On the Ground Management guidelines are** being conformed with as follows:

- The Ely district does encourage OHV use on existing or designated roads and trails, except in closed areas, prior to land use plans being updated and road and trail inventories completed through public involvement efforts.
- The Ely district has identified all the linear transportation routes resulting from OHV use in the Cave Valley watershed. All this in preparation for a route transportation planning process that will attempt to conserve soil functionality, vegetative cover, and watershed health by evaluating all the transportation routes within the watersheds and designating those which meet the social and biological demands, while maintaining OHV access.
- The Ely district does manage and monitor permitted OHV activities to minimize impacts to travel routes, to minimize impact on plant and animal habitats and to conserve watershed and water quality. This is done by directing use to the most resistant and resilient routes in the watershed which still meet the social needs of the public. Any travel routes used in the permitted event found to be highly impacted, require rehabilitation in accordance with the OHV special recreation permit stipulations. Routes that do not respond to rehabilitation as desired are consciously discouraged in the future.
- The Ely District is making efforts to utilize benefits based management

objectives as those objectives relate to managing for recreation Within the Cave Valley Watershed. The BLM is directing OHV recreation onto designated trails. Portions of the nationally designated Silverstate Off-Highway Vehicle trail are located within Cave Valley watershed.

- Long term monitoring concerning travel on the Silverstate Trail are being done sufficiently.
- OHV use pursuant to a permitted activity shall be governed by the terms of the permit is being followed by the Ely district.
- The Ely District does engineer, locate, and relocate important transportation roads to accommodate OHV activities while minimizing resource impacts, as budgets allow. On the ground road inventories have been completed on the Cave Valley watershed, revealing 447 miles of roads. This results in an average of 1.2 miles of road per square mile in Cave Valley. These averages are within the acceptable range when compared with another transportation planning effort (duck creek transportation plan) completed within the Ely district.
- The Ely District does encourage cooperation in law enforcement among all agencies in regards to OHV management.

The analysis and interpretation of OHV travel management by the Watershed ID Team indicates Resource Advisory Council (RAC) **On the Ground Management guidelines are not** being conformed with:

- A Travel Management plan for Cave Valley does not exist.
- Seasonal closures where applicable are not being done.
- Long term monitoring concerning non designated travel routes and route conditions are not being done sufficiently.

Recommendations:

- Work with the public, landowners and cooperating agencies to formulate a travel management plan for Cave Valley watershed. Designate suitable roads while preserving access. Rehabilitate unsuitable routes as guided by the completed transportation plan. These roads may require stabilization, closure or re-routing to prevent the further degradation of these roads and the watersheds. Efforts should be made to design and build sustainable routes where needed.
- Implement the recreation strategic plan as it relates to OHV management and other forms of recreation in the Cave Valley watershed.
- Work with user groups and local agencies to formulate management plans for the SRMA and special permit areas within Cave Valley Watershed.
- Partner with ride and race vendors to design and deliver educational programs for OHV users.
- Select race routes that avoid weed infestations.
- Clean OHV's before and after authorized races.

OHV ADMINSTRATION GUIDELINE FOR NEVADA PUBLIC LANDS

- Planning guidelines

The analysis and interpretation of OHV travel management by the Watershed ID Team indicates Resource Advisory Council (RAC) **Planning Management guidelines are** being conformed with:

- For addressing/resolving local site-specific OHV issues/concerns, The Ely district does actively participate in and use collaborative planning groups consisting of local representative(s), affected/interested group(s) and agency(s).
- Lands being managed will be re-designated to open limited or closed to motorized travel in the current land use plan to better implement the travel management process.
- In the proposed land use plan social and economic effects of OHV use including special recreation permits is addressed.
- The Ely district is working to establish and maintain an inventory of existing routes and trails for planning purposes.
- The Ely district recreation plan does assess and plan for the current and future OHV demand.

The analysis and interpretation of OHV travel management by the Watershed ID Team indicates Resource Advisory Council (RAC) **Planning Management guidelines are not** being conformed with:

- Until a new land use plan is implemented we cannot implement our recreation plan to the extent needed to address the needs and concerns associated with OHV management in the Cave Valley Watershed.

Recommendations:

- Provide special opportunities for OHV recreation in a sustainable way. OHV recreationists and the overall health of the watersheds would benefit from a well designed network of trails and trailheads that incorporate proper trail design. Well designed trail systems that cater to the user will discourage the proliferation of unwanted roads and trails in the watershed.

OHV ADMINSTRATION GUIDELINE FOR NEVADA PUBLIC LANDS

- Education guidelines

The analysis and interpretation of OHV travel management by the Watershed ID Team indicates Resource Advisory Council (RAC) **Education guidelines are** being conformed with:

- The Ely district does utilize high use areas (Duck Creek Basin) and special events (OHV races) to maximize the dissemination of responsible use education materials and concepts to the public.
- The Ely district does Encourage the private sector, as well as the public sector, to conduct responsible marketing of activities on public lands while avoiding the promotion of products, behaviors and services that are inconsistent with existing regulations and land use plans.
- The Ely district does actively promote/expand/disseminate materials from programs such as (but not limited to) "Tread Lightly!" and "Leave No Trace".
- Communication and environmental education plan(s) do exist. We do assess all situations where OHV use may require public information and education, as well as develop materials and programs appropriate to each situation.

The analysis and interpretation of OHV travel management by the Watershed ID Team indicates Resource Advisory Council (RAC) **Education guidelines are not** being conformed with:

- More action needs to done to cooperatively develop/improve public outreach programs to promote trail etiquette, environmental ethics, and responsible-use stewardship ethic.
- Implementation of the communication, environmental and education plans need to be better employed.

Recommendations:

- Increase education on OHV safety and responsible riding in the community.
- Increase the promotion of federally approved public education programs such as Tread Lightly and Leave no Trace.
- Increase the utilization of public communication channels such as newspaper radio, internet, booths etc.
- Increase education related to OHV use as a weed vector. Information should be readily available for the public.

Evaluation Summary

Summary of achievement or non achievement land health standards for the Meadow Valley Wash North and South Watersheds.

Standard	Meeting	Not meeting	Current Livestock Management Compliant with Guidelines
Standard 1. Soils		x	Yes

Indicators considered:

- Vegetation ground cover
- Surfaces (e. g. biological crusts, pavements)
- Compaction/infiltration of soils
- Streambank stability

Why not meeting:

Tree overstory exceeds standards in most pinyon-juniper woodlands, juniper savannah woodlands, and all sagebrush vegetation types. Shrub cover exceeds standard in all sagebrush and salt desert shrub types. Understory herbaceous vegetation cover is inversely related to overstory cover. As woody species increase, perennial bunch grasses and forbs decrease. Sparse or absent understory cover increases the potential for accelerated soil erosion and disruption of nutrient cycle. Field observation from the field tour indicate riparian soils are being affected by permittees at Big Spring.

Causal Factors:

- Historic grazing practices in the wake of European settlement of the West;
- Increasingly effective fire suppression and control in last century.
- The introduction and spread of non-native annual grasses.
- Climate change or drought conditions in recent years.
- Localized overuse especially near water sources by livestock, and elk.
- Improperly designed roads and density of roads in some areas.

Recommendations:

- Implement restoration treatments with the objective of increasing herbaceous cover and decreasing spread of annual grasses as economically and ecologically feasible
- Manage livestock to adhere to standards and guidelines.
- Continue management of wild horse herds.

- Where feasible, build protective fences around riparian areas.
- Develop a transportation plan to address improvement of road locations, closure of roads, and inhibit the creation of new roads.

Standard	Meeting	Not meeting	Current Livestock Management Compliant with Guidelines
Standard 2 Ecosystem Components		x	Yes

Indicators considered:

- Upland line-point intercept cover data
- Watershed-scale Fire Regime Condition Class analysis
- Riparian Proper Functioning Condition assessments
- Weed infestation inventories
- Mining and ROW surface disturbance surveys

Why not meeting:

- Functional group mean cover values do not meet ecological site standards. The majority of vegetation types in the Cave Valley Watershed show excessive cover of woody species and sparse to absent cover of herbaceous species. This includes the encroachment of various conifers species into sagebrush and aspen sites.
- Cheatgrass is present in most vegetation types and will potentially increase in cover.
- FRCC analysis shows 77 percent of the watershed is in Condition Class 2 or 3.
- Riparian proper function and condition evaluation indicates majority of riparian areas are either nonfunctional or functioning at risk.

Causal Factors:

- Historic grazing practices in the wake of European settlement of the West;
- Increasingly effective fire suppression in last century.
- The introduction and spread of non-native annual grasses.
- Climate change or drought conditions in recent years.
- Riparian proper function and condition: Unauthorized livestock use is a contributing factors to decreased herbaceous cover around many of the riparian ecological zones evaluated as “functioning-at-risk” or “non-functioning”. Changes in riparian zone ecological function is also directly attributed to pinyon-juniper tree encroachment and expansion,
- Drought
- Permitted obstructions and diversions of springs and stream flow.

Recommendations:

- Develop restoration strategy for the watershed and apply restoration treatments with the objective of increasing herbaceous cover and decreasing the spread of annual grasses as economically and ecologically feasible.
- Maintain livestock management that adheres to guidelines that supports ecological sustainability.
- Continue management of wild horse herds.
- Where feasible, build protective fences around riparian areas.
- Visit all seeps, springs, wetlands and streams that have been evaluated as functioning-at-risk PFC or fully developed to plan for water source improvements.
- Increase weed inventories and treatments throughout the Cave Valley Watershed

Standard	Meeting	Not meeting	Current Livestock Management Compliant with Guidelines
Standard 3. Habitat and Biota		X	Yes

Indicators considered:

Ecosystem component indicators from Standard 2 as well as wildlife indicators

Why not meeting:

Functional group mean cover values do not meet ecological site standards. The majority of vegetation types in the Cave Valley Watershed show excessive cover of woody species and sparse to absent cover of herbaceous species. Cheatgrass is present in most vegetation types and will potentially increase in cover. FRCC analysis shows 77 percent of the watershed is in Condition Class 2 or 3. Riparian proper function and condition evaluation indicates majority of riparian areas are either fully developed or functioning at risk. Roads and road density is high is high or poorly placed such as through riparian areas.

Causal Factors:

- Historic grazing practices in the wake of European settlement of the West
- Increasingly effective fire suppression in last century
- The introduction and spread of non-native annual grasses
- Climate fluctuations in recent years
- Localized overuse especially near water sources by livestock, wild horse and elk
- Road density that creates fragmentation of habitat
- Weeds transported along travel corridors that get established and displace viable habitat

Recommendations:

- Implement treatments with the objective of increasing herbaceous cover and decreasing the spread of annual grasses as economically and ecologically feasible.
- Continue monitoring wildlife habitat.
- Maintain livestock management that adheres to standards and guidelines.
- Continue management of Dry lake wild horse HMA.
- Where feasible, build protective fences around riparian areas.

Standard	Meeting	Not meeting	Current Livestock Management Compliant with Guidelines
Standard 4. Wild Horse and Burros	X		N/A
Causal Factors: N/A			
Recommendations: It has been recommended that the use of the Dry Lake HMA by wild horses be continued and the herd sizes be managed within the appropriate management level range for the HMA.			

OHV ADMINSTRATION GUIDELINE FOR NEVADA PUBLIC LANDS
On-the-ground management guidelines.
Conforming to the Guidelines**:**
• The Ely district does encourage OHV use on existing or designated roads and trails, except in closed areas, prior to land use plans being updated and road and trail inventories completed through public involvement efforts. • The Ely district has identified all the linear transportation routes resulting from OHV use in the Cave Valley watershed. All this in preparation for a route transportation planning process that will attempt to conserve soil functionality, vegetative cover, and watershed health by evaluating all the transportation routes within the watersheds and designating those which meet the social and biological demands, while maintaining OHV access. • The Ely district does manage and monitor permitted OHV activities to minimize impacts to travel routes, to minimize impact on plant and animal habitats and to conserve watershed and water quality. This is done by directing use to the most resistant and resilient routes in the watershed which still meet the social needs of the public. Any travel routes used in the permitted event found to be highly impacted, require rehabilitation in accordance with the OHV special recreation permit stipulations. Routes that do not respond to rehabilitation as desired are consciously discouraged in the future. • The Ely District is making efforts to utilize benefits based management objectives as those objectives relate to managing for recreation Within the Cave Valley Watershed. The BLM is directing OHV recreation onto designated trails. Portions of the nationally designated Silverstate Off-Highway Vehicle trail are located within Cave Valley watershed. • Long term monitoring concerning travel on the Silverstate Trail are being done sufficiently. • OHV use pursuant to a permitted activity shall be governed by the terms

of the permit is being followed by the Ely district. • The Ely District does engineer, locate, and relocate important transportation roads to accommodate OHV activities while minimizing resource impacts, as budgets allow. On the ground road inventories have been completed on the Cave Valley watershed, revealing 422 miles of roads. This results in an average of 1.2 miles of road per square mile and a maximum road density of 4.9 miles of road per square mile in Cave Valley. These averages are within the acceptable range when compared with another transportation planning effort (duck creek transportation plan) completed within the Ely district. • The Ely District does encourage cooperation in law enforcement among all agencies in regards to OHV management.
Not conforming to the Guidelines**:**
• A Travel Management plan for Cave Valley does not exist. • Seasonal closures where applicable are not being done. • Long term monitoring concerning non designated travel routes and route conditions are not being done sufficiently.
Recommendations**:**
• Work with the public, landowners and cooperating agencies to formulate a travel management plan for Cave Valley watershed. Designate suitable roads while preserving access. Rehabilitate unsuitable routes as guided by the completed transportation plan. These roads may require stabilization, closure or re-routing to prevent the further degradation of these roads and the watersheds. Efforts should be made to design and build sustainable routes where needed. • Implement the recreation strategic plan as it relates to OHV management and other forms of recreation in the Cave Valley watershed. • Work with user groups and local agencies to formulate management plans for the SRMA and special permit areas within Cave Valley Watershed. • Partner with ride and race vendors to design and deliver educational programs for OHV users. • Select race routes that avoid weed infestations. • Clean OHV's before and after authorized races.

Planning guidelines
Conforming to the Guidelines:
• For addressing/resolving local site-specific OHV issues/concerns, The Ely district does actively participate in and use collaborative planning groups

consisting of local representative(s), affected/interested group(s) and agency(s).
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- In the proposed land use plan social and economic effects of OHV use including special recreation permits is addressed.
- The Ely district is working to establish and maintain an inventory of existing routes and trails for planning purposes.

The Ely district recreation plan does assess and plan for the current and future OHV demand.

Not conforming to the Guidelines:

- Until a new land use plan is implemented we cannot implement our recreation plan to the extent needed to address the needs and concerns associated with OHV management in the Cave Valley Watershed.

Recommendations**:**

- Provide special opportunities for OHV recreation in a sustainable way. OHV recreationists and the overall health of the watersheds would benefit from a well designed network of trails and trailheads that incorporate proper trail design. Well designed trail systems that cater to the user will discourage the proliferation of unwanted roads and trails in the watershed.

Education guidelines

Conforming to the Guidelines:

- The Ely district does utilize high use areas (Duck Creek Basin) and special events (OHV races) to maximize the dissemination of responsible use education materials and concepts to the public.
- The Ely district does Encourage the private sector, as well as the public sector, to conduct responsible marketing of activities on public lands while avoiding the promotion of products, behaviors and services that are inconsistent with existing regulations and land use plans.
- The Ely district does actively promote/expand/disseminate materials from programs such as (but not limited to) “Tread Lightly!” and “Leave No Trace”.
- Communication and environmental education plan(s) do exist. We do assess all situations where OHV use may require public information and education, as well as develop materials and programs appropriate to each situation.

Not conforming to the Guidelines:
• More action needs to done to cooperatively develop/improve public outreach programs to promote trail etiquette, environmental ethics, and responsible-use stewardship ethic. • Implementation of the communication, environmental and education plans need to be better employed.
Recommendations: • Increase education on OHV safety and responsible riding in the community. • Increase the promotion of federally approved public education programs such as Tread Lightly and Leave no Trace. • Increase the utilization of public communication channels such as newspaper radio, internet, booths etc. • Increase education related to OHV use as a weed vector. Information should be readily available for the public.

List of Interdisciplinary Team Members

Jeff Fenton	Fuel Management Specialist
Kalem Lenard	Recreation Specialist
Dave Jacobson	Wilderness
Chelsy Simerson	Range Management Specialist
Gary Medlyn	Projects Manager
Deb Koziol	Wildlife Biologist
Bonnie Milllion	Weeds Specialist
Ben Noyes	Wild Horse Specialist
Kari Harrison	Soil Specialist
Gina Jones	Ecologist
Julie Thompson	ENLC Plant Ecologist
Jennifer Brickey	ENLC Botanist
John Watt	ENLC Minerals compliance
Shane Trautner	ENLC Range Management Specialist

Maps

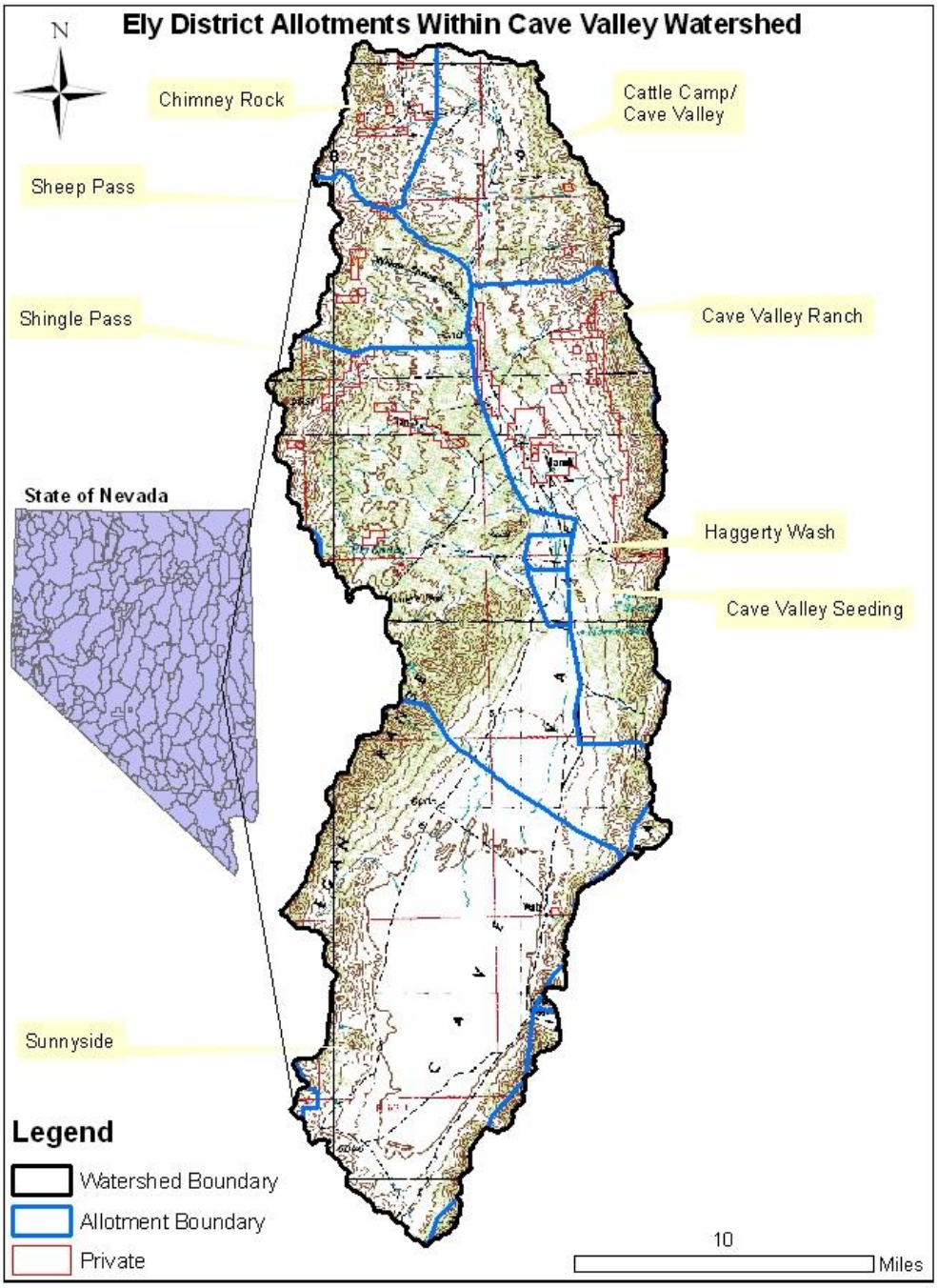
Map 1. Ely District Allotments within the Cave Valley Watershed

Map 2. Cave Valley Watershed Potential Major Vegetation Community Types as Defined by Soil Map Units

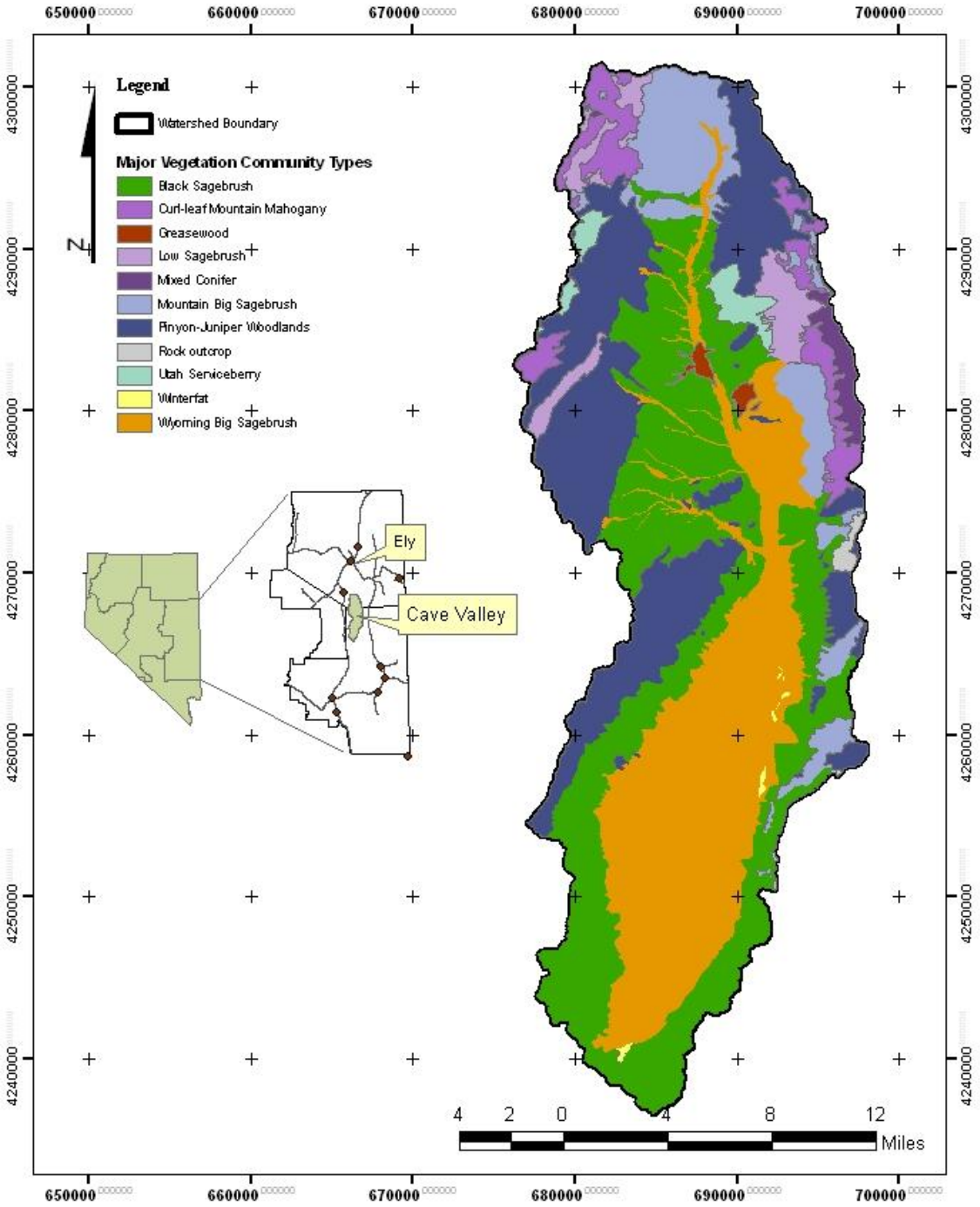
Map 3. Cave Valley Watershed Weed Inventory Map: Species and Land Management

Map 4. Road Densities in Cave Valley Watershed

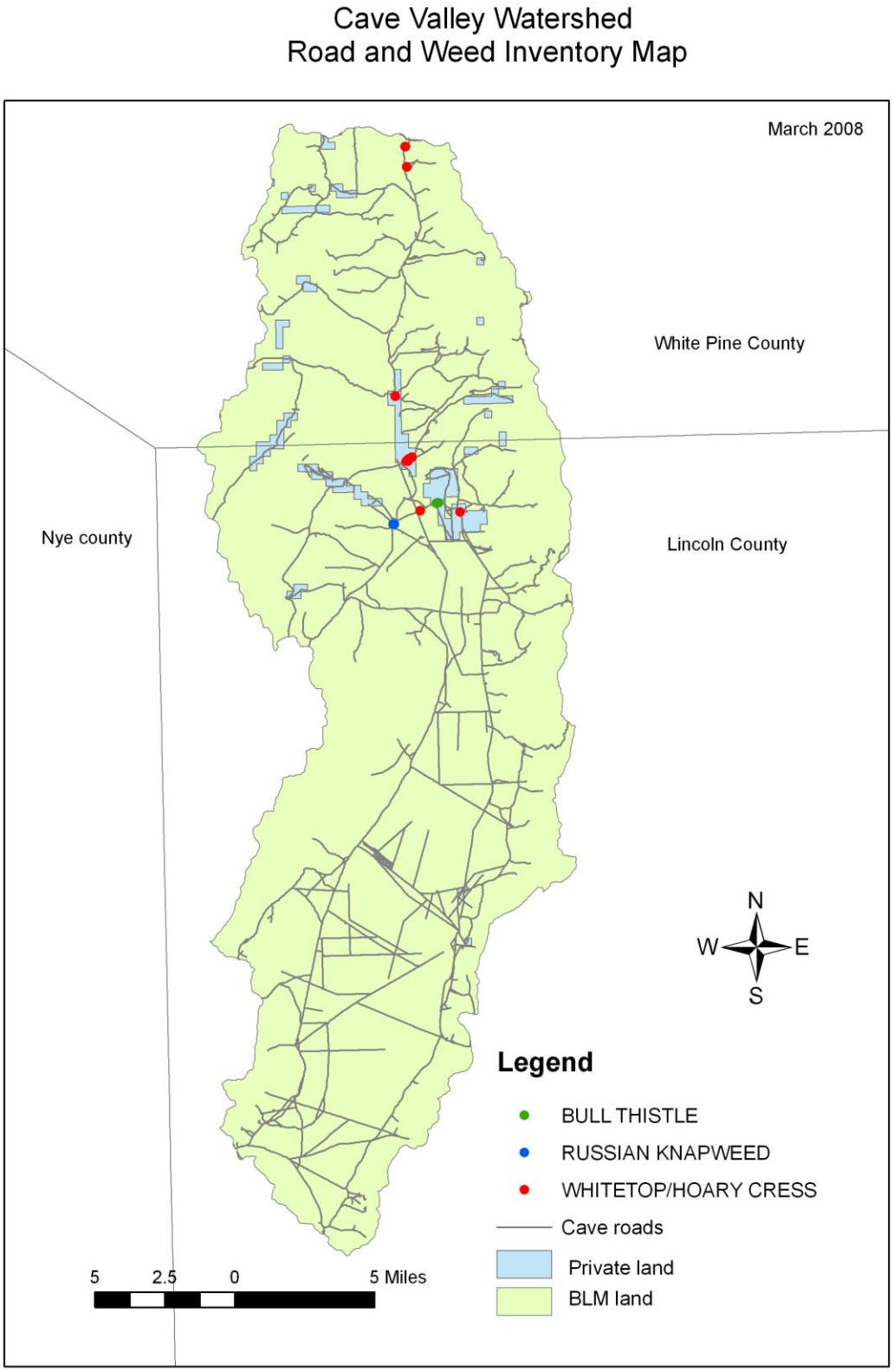
Map 1. Ely District Allotments within the Cave Valley Watershed



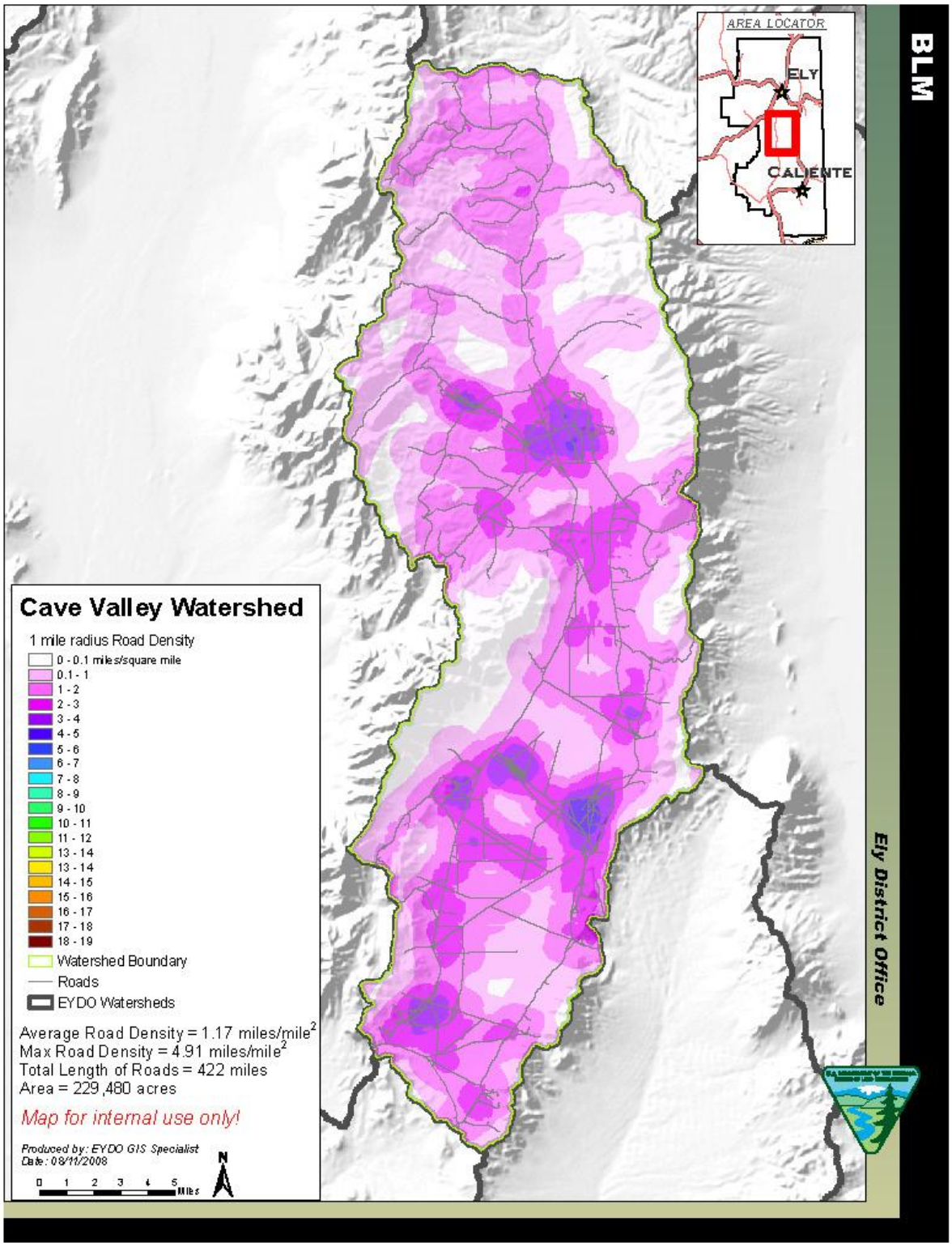
Map 2. Cave Valley Watershed Potential Major Vegetation Community Types as Defined by Soil Survey Data



Map 3. Cave Valley Watershed Weed Inventory Map: Species and Land Management



Map 4. Road Densities in Cave Valley Watershed



Appendix A

Livestock conformance to guidelines data and narratives for Standards.

Table A.1. Cave Valley livestock use and objectives summary

Allotment Name and Number	Permittee	Season of Use	Kind of Livestock	Total AUM's	Active AUMs	suspended AUMs	Acres Within Water Shed	Livestock Actual Use	Key Area	Key Area Actual Use	Utilization Objective	Grazing use levels in watershed overall
Cattle Camp and Cave V. #00903	Carter Cattle Company	8/02-11/03	Cattle	2431	3185	0	75,846	2431	CC-01 CC-02 CC-03 CC-04	Moderate Moderate Moderate Moderate	Moderate	Moderate
Cattle Camp and Cave V. #00903	Gubler, Ernest H. Incorporated	6/01-11/25	Cattle	1652	3160	0	75,846	1652			Moderate	Moderate
Cattle Camp and Cave V. #00903	Frank Reid	6/14-11/30	Cattle	455	533	0	75,846	455			Moderate	Moderate
Cave Valley Seeding #00908	Kevin and Wilma Whipple	5/01-8/10	Cattle	201	200	0	942	201	No		Moderate	Moderate
Chimney Rock #00914	Blue Diamond Oil corp.	10/09-11/01	Cattle	406	1233	0	20,037	406	No		Moderate	Moderate
Sheep Pass #00905	John Laverne Whipple	4/01-12/31	Cattle	763	758	480	26,800	763	SP-01	Heavy	Moderate	Heavy
Sheep Pass #00905	Kevin and Wilma Whipple	4/01-11/15	Cattle	391	392	211	26,800	391			Moderate	Heavy

Shingle Pass #00906	Bruce and Pamela Jensen		Cattle	1453	2724	3428	74,788	1453	No		Moderate	Moderate
Sunnyside #21023	Bruce and Pamela Jensen	1/01-2/28	Cattle	2148	5402	0	219,519	2148	No		Moderate	Light to moderate
Cave Valley Ranch #00904	Cave Valley Ranch LLC.	5/01-10/31	Cattle	4969	2403	2566	41,231	4969	CV-01 CV-02	Moderate Heavy	Moderate	Moderate
Haggerty Wash #00907	Lewis, Paul C.	6/15-10/15	Cattle	194	194	0	1,056	194	No		Moderate	Light

Table A.2. Cave Valley livestock management conformance to guidelines for Mohave-Southern Great Basin RAC Standards and state-wide OHV guidelines for Cave Valley Watershed by Allotment

Allotment name and number	Does Current Allotment Management Conform to Guidelines by Standard or Guideline?					Resource Concerns (including discernible cause of resource concern)
	Standard and Guideline No.					
	1. Soils	**2.** Ecosystem Components	**3.** Habitat & Biota	**4.** WH&B	**5.** OHV	
Cattle Camp/Cave Valley #00903	Yes	Yes	Yes	N/A	N/A	There was decent diversity and coverage throughout, but there was a lot of pinyon/juniper regeneration and encroachment which will eventually reduce the understory of grasses and shrubs.
Cave Valley Seeding #00908	Yes	Yes	Yes	N/A	N/A	
Haggerty Wash Seeding	Yes	Yes	Yes	N/A	N/A	

Cave Valley Ranch #00904	Yes	Yes	Yes	N/A	N/A	The only part of the allotment that was overgrazed was in the southwest part which was a foothill towards the mountain, and the dominant grass was dropseed. There was not a lot of water coming out of quartzite spring.
Sheep Pass #00905	Yes	Yes	Yes	N/A	N/A	Not much understory grass and shrubs throughout the allotment, where there was grass it was heavily overgrazed. Very poor in terms of species diversity and coverage. Although the Blue spring was rated as PFC, the Stream coming from it was in very poor condition. Almost no grass or deep binding rootmass coverage, very entrenched in some places, and erosion throughout the whole stream. Cattle impact is the main causal factor for this streams degradation.
Shingle Pass #00906	Yes	Yes	Yes	N/A	N/A	In the open areas of the trees, there is some broom snakeweed and cheatgrass moving in.
Sunnyside #21023	Yes	Yes	Yes	Yes	N/A	Most of the allotment within the silt flat area ranked very low in terms of species diversity. This area was mostly just sagebrush with rabbitbrush starting to colonize and take over the area. Many areas had virtually no grass at all. I don't think this is caused by too much cattle grazing, but too much historical overuse by horses. The drought and lack of moisture are also factors for degradation in this area.